⑥

TestoiHSO 4113

Test Specifications Distributor-type Fuel-injection Pumps

En

46

WPP 001/4 REN 2,0 e

4. Edition

supersedes 3.83
company Renault
engine F 8 M

VE 4/9 F 2400 R 95

0 460 494 105

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	4,1-4,5	mm		
1.2 Supply pump pressure	1400	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1000	30,7-31,7	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0	cm³/1000 strokes		2,0 (3,0)
1.5 Start	100	min. 42,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2650	10,5-16,5	cm³/1000 strokes		
1.7 Load-dependent start of delivery	1400	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	2000	2400
	mm	2,3-3,1(2,0-3,4)	(3,6-5,0)	6,3-7,1(6,0-7,4)	7,0-7,7(6,6-8,0)
2.2 Supply pump	n = rev/min	600			2400
	bar (kgf/cm²)	2,5-3,1			7,7-8,3
Overflow delivery	n = rev/min	600			2400
	cm³/10 s	55-138(40-153)			55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2750	max. 6,0		
	2650		(9,5-17,5)	
	2500	21,0-29,0	(21,0-29,0)	
	2400	27,5-30,1	(26,5-31,1)	
	2100	28,9-31,3	(27,8-32,4)	
	1400	31,7-33,7	(30,4-35,0)	
	1000		(28,9-33,5)	
	600	25,2-28,2	(23,7-29,7)	
switch-off	2400	0		
Idle stop	650	0		
	600	0,2-5,2		
	425		(4,0-12,0)	
End stop	330	min. 30,0		
	500	max. 29,0		
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V			
	test voltage xxxxxxx rated voltage 12V.			

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	2,8
XK	18,7-20,7
XL (B written above)	9,5-12,8

Observations

Please note instructions on sheet 2.

A1

10.83

A1

Testing the hydr. cold-start accelerator:

Apply 12 V to expansion element of hydr. cold-start accelerator.
At 300 1/min there must be a timing-device travel of 1.3- 3.3 mm.

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 a
3. Edition
En

VE 6/10 F 2400 L 116
0 460 406 018

supersedes 10.83
company: VWW
engine 087 - T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

Testoil-ISO 4113

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,4-1,8	mm	0,75	
1.2 Supply pump pressure	1500	5,7-6,3	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	26,5-27,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0-45,0	cm³/1000 strokes	0,75	2,5 (3,0)
1.4 Idle speed regulation	415	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2675	10,0-16,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75 bar	n = rev/min	1200	1500	2400
	mm	0,2-1,0(0-1,3)	(0,9-2,3)	4,1-4,9(3,8-5,2)
2.2 Supply pump LDA=0,75 bar	n = rev/min	600		2400
	bar (kgf/cm²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400 (0,75 bar)
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2850	max. 4,0		0,75
	2675		(9,0-17,0)	0,75
	2400	35,5-37,5	(34,2-38,8)	0,75
	1500		(42,2-46,8)	0,75
	800 *	33,5-34,5	(31,0-37,0)	0,30
	600		(24,0-30,0)	0
switch-off elektr.	400	0		
Idle stop	415		(4,0-12,0)	
	600	max. 3,0		
End stop	400	min. 20,0		
	500	max. 30,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V
test voltage xxxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
AXK	21,8-23,8
BKL	9,4-12,7

Observations

Manifold-pressure compensator stroke = 4,2 mm
Correction at the adjusting nut. (46)

12.83

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 d
3. Edition
En

VE 6/10 F 2400 L 116-1
0 460 406 019

supersedes 10.83
company VWW
engine 087 - T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting – mm

Testoil-ISO 4113

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,4-1,8	mm	0,75	
1.2 Supply pump pressure	1500	5,7-6,3	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	26,5-27,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0-45,0	cm³/1000 strokes	0,75	2,5 (3,0)
1.4 Idle speed regulation	415	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2675	10,0-16,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75 bar	n = rev/min	1200	1500	2400
	mm	0,2-1,0(0-1,3)	(0,9-2,3)	4,1-4,9(3,8-5,2)
2.2 Supply pump LDA=0,75 bar	n = rev/min	600		2400
	bar (kgf/cm²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400 (0,75 bar)
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2850	max. 4,0		0,75
	2675		(9,0-17,0)	0,75
	2400	35,5-37,5	(34,2-38,8)	0,75
	1500		(42,2-46,8)	0,75
	800 *	33,5-34,5	(31,0-37,0)	0,30
	600		(24,0-30,0)	0
switch-off				
mech.	2400	0		
elektr.	400	0		
Idle stop	415		(4,0-12,0)	
	600	max. 3,0		
End stop	400	min. 20		
	500	max. 30		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V; test xxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
AXK	21,8-23,8
BXL	9,4-12,7

Observations

Manifold-pressure compensator stroke = 4,2 mm
Correction at the adjusting nut. (46)

BOSCH

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Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,0 i 1

2. Edition

En

Testoil-ISO 4113

VE 5/10 F 2250 L 133

0 460 405 031

supersedes 7.83
company VWW
engine 153 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting 0,2 mm ± 0,02 (0,04)

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,1-3,5	mm	0,75 bar	
1.2 Supply pump pressure	1500	5,5-6,1	bar (kgf/cm²)	0,75 bar	
1.3 Full-load delivery without charge-air pressure	500	21,5-22,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	43,5-44,5	cm³/1000 strokes	0,75 bar	2,5 (3,0)
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Start	100	min. 50,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2525	9,0-15,0	cm³/1000 strokes	0,75 bar	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA:0,75 bar	n = rev/min	850	1500	2250
	mm	1,1-1,9(0,8-2,2)	(2,6-4,0)	5,4-6,2(5,1-6,5)
2.2 Supply pump LDA:0,75 bar	n = rev/min	500		2250
	bar (kgf/cm²)	3,2-3,8		7,3-7,9
Overflow delivery	n = rev/min	500		2250
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2700	max. 3,0		0,75 bar
	2525		(8,0-16,0)	0,75 bar
	2250	37,0-39,0	(35,8-40,2)	0,75 bar
	1500		(41,8-46,2)	0,75 bar
	* 850	32,5-33,5	(30,8-35,2)	0,3 bar
	500		(19,0-25,0)	0
switch-off elect.	400	0		
Idle stop	375		(4,0-12,0)	
	400	max. 3,0		
	**1125	20,5-22,5		
	400	min. 18,0		
End stop	500	max. 25,0		

2.4 Solenoid

max. cut-in voltage xxx min. 10 V
xxxxxxxxxx rated voltage 12V.
~~hold voltage~~

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,7-6,0
MS	1,7-1,9
SVS	4,2
A	
B	

Observations

Please note instructions on sheet 2.

10.83

A5

A5

Adjust TAS only at full LDA pressure of 0.75 bar.

** Adjust EGR with gauge.

* Manifold-pressure compensator stroke = 3,6

Correction at the adjusting nut. (46)

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 W 6
1. Edition
En

Testoil-ISO 4113

VE 4/9 F 2250 R 134-4
0 460 494 137

supersedes–
company: VWW
engine: 086 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,2-3,7	mm	0,75	
1.2 Supply pump pressure	1500	5,5-6,1	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	22,5-23,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	42,5-43,5	cm³/1000 strokes	0,75	2,5 (3,0)
1.4 Idle speed regulation	475	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Start	100	min. 35	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2525	9,0-15,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery	–				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75 bar	n = rev/min	1000	1500	2250
	mm	1,3-2,1(1,0-2,4)	(2,8-4,2)	6,0-6,8(5,7-7,1)
2.2 Supply pump LDA=0,75 bar	n = rev/min	600		2250
	bar (kgf/cm²)	3,3-3,9		7,4-8,0
Overflow delivery	n = rev/min	600 (0 bar)		2250 (0,75 bar)
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2750	max. 3,0		0,75
	2525		(8,0-16,0)	0,75
	2250	38,0-40,0	(36,7-41,3)	0,75
	1500		(40,7-45,3)	0,75
	* 1000	32,5-33,5	(30,7-35,3)	0,30
	600		(20,0-26,0)	0
switch-off elektr.	400	0		
Idle stop	475		(4,0-12,0)	
	1200	max. 4,0		
**	1125	22,0-24,0		
End stop	400	min. 21		
	500	max. 29		

2.4 Solenoid: max. cut-in voltage xxx min. 10 V
test voltage xxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,2-1,4
SVS	3,2
A	
B	

Observations

Please note instructions on sheet 2.

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* Manifold-pressure compensator stroke = 4,0

** Setting point for EGR

Pull control lever toward full load untill gauge fits over driver and housing cover web. Measure delivery.

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 l
1. Edition

En

Testoil-ISO 4113

VE 6/10 F 2400 L 144

0 460 406 029

supersedes -
company VWW
engine 087 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Te.. Benches and Testers

Test instructions and Test Equipment see VDT-W-460/.

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,2-1,6	mm	0,75 bar	
1.2 Supply pump pressure	1500	5,7-6,3	bar (kgf/cm²)	0,75 "	
1.3 Full-load delivery without charge-air pressure	600	25,5-26,5	cm³/1000 strokes	0 "	
Full-load delivery with charge-air pressure	1500	44,0-45,0	cm³/1000 strokes	0,75 "	2,5 (3,0)
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes	0 "	2,0 (3,0)
1.5 Start	100	min. 42	cm³/1000 strokes	0 "	
1.6 Full-load speed regulation	2600	10,0-16,0	cm³/1000 strokes	0,75 "	
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA = 0,75 bar	n = rev/min	1500	1500	2000	2000	2400
	mm	(0,7-2,1)	(*)	3,6-4,4(3,3-4,7)	(*)	5,6-6,4(5,3-6,7)
2.2 Supply pump LDA = 0,75 bar	n = rev/min	600	*1500	2400		
	bar (kgf/cm²)	3,3-3,9	6,8-7,4	8,1-8,7		
Overflow delivery	n = rev/min	600 (0 bar)		2400 (0,75 bar)		
	cm³/10 s	55-138(40-153)		55-138(40-153)		

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2750	max. 4,0	0,75
	2600	(9,0-17,0)	0,75
	2400	35,0-37,0(33,7-38,3)	0,75
	1500	(42,2-46,8)	0,75
	**800	32,5-33,5(30,7-35,3)	0,3
	600	(23,7-28,3)	0
switch-off elect.	400	0	
Idle stop	375	(4,0-12,0)	
	450	max. 3,0	
End stop	400	min. 20	
	500	max. 30	

2.4 Solenoid — max. cut-in voltage xxx min. 10 V
xxx rated voltage 12V.

3. Dimensions

for assembly and adjustment mm

Designation	mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	max.6,0
**LDA-Hub	5,3
A	
B	

Observations

Please note instructions on sheet 2.

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BOSCH

* Test hydr. cold-start accelerator:
At the designated points do not apply voltage to magnet of hydr. cold-start accelerator.

1500 1/min 3,0 - 4,0 (2,8 - 4,2)
2000 1/min 4,9 - 6,1 (4,8 - 6,2)

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 l 1
1. Edition
En

Testoil-ISO 4113

VE 6/10 F 2400 L 144-1

0 460 406 030

supersedes –
company VWW
engine 087 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,2-1,6	mm	0,75 bar	
1.2 Supply pump pressure	1500	5,7-6,3	bar (kgf/cm²)	0,75 "	
1.3 Full-load delivery without charge-air pressure	600	25,5-26,5	cm³/1000 strokes	0 "	
Full-load delivery with charge-air pressure	1500	44,0-45,0	cm³/1000 strokes	0,75 "	2,5 (3,0)
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes	0 "	2,0 (3,0)
1.5 Start	100	min. 42	cm³/1000 strokes	0 "	
1.6 Full-load speed regulation	2600	10,0-16,0	cm³/1000 strokes	0,75 "	
1.7 Load-dependent start of delivery	–				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1500	1500	2000	2000	2400
LDA = 0,75 bar	mm	(0,7-2,1)	(*)	3,6-4,4(3,3-4,7)	(*)	5,6-6,4(5,3-6,7)
2.2 Supply pump	n = rev/min	600	*1500	2400		
LDA = 0,75 bar	bar (kgf/cm²)	3,3-3,9	6,8-7,4	8,1-8,7		
Overflow delivery	n = rev/min	600 (0 bar)		2400 (0,75 bar)		
	cm³/10 s	55-138(40-153)		55-138(40-153)		

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2750	max. 4,0	0,75
	2600	(9,0-17,0)	0,75
	2400	35,0-37,0(33,7-38,3)	0,75
	1500	(42,2-46,8)	0,75
	**800	32,5-33,5(30,7-35,3)	0,3
	600	(23,7-28,3)	0
switch-off mech.	2400	0	
elektr.	400	0	
Idle stop	375	(4,0-12,0)	
	450	max. 3,0	
End stop	400	min. 20	
	500	max. 30	

2.4 Solenoid

max. cut-in voltage xxx min. 10 V
xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	max.6,0
**LDA-Hub	5,3
A	
B	

Observations

Please note instructions on sheet 2.

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung.

* Test hydr. cold-start accelerator:
At the designated points do not apply voltage to magnet of hydr. cold-start accelerator.

1500 1/min 3,0 - 4,0 (2,8 - 4,2)
2000 1/min 4,9 - 6,1 (4,8 - 6,2)

Test Specifications Distributor-type Fuel-injection Pumps

En

WPP 001/4 VWW 2,4 l 3
1. Edition

VE 6/10 F 2400 L 146

0 460 406 033

supersedes -
company VWW
engine: 087

Testoil ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/ .

Pre-stroke setting - mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,8-3,2	mm		
1.2 Supply pump pressure	1500	5,2-5,8	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes		2,0 (3,0)
1.5 Start	100	min. 35	cm³/1000 strokes		
1.6 Full-load speed regulation	2700	6,0-12,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	750	750	1500	1500	2400
	mm	0,2-1,0(0-1,3)	(*)	(2,3-3,7)	(*)	5,7-6,5(5,4-6,8)
2.2 Supply pump	n = rev/min	600	*1500	2400		
	bar (kgf/cm²)	2,8-3,4	6,3-6,9	7,7-8,3		
Overflow delivery	n = rev/min	600	2400			
	cm³/10 s	55-138(40-153)	55-138(40-153)			

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2825	max. 3,0	
	2700	(5,0-13,0)	
	2400	22,0-24,0(20,7-25,3)	
	1500	(26,7-31,3)	
	750	26,0-29,0(24,5-30,5)	
switch-off elect.	400	0	
Idle stop	375	(4,0-12,0)	
	600	max. 4,0	
End stop	400	min. 20	
	500	max. 25	

2.4 Solenoid	
max. cut-in voltage	xxx min. 10 V
[illegible]xxx	rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,4-6,7
MS	1,5-1,7
SVS	3,6
A	
B	

Observations

Please note instructions on sheet 2.

BOSCH

10.83

* Test hydr. cold-start accelerator:
At the designated points do not apply voltage to magnet of hydr. cold-start accelerator.
750 1/min 1,2 - 2,4 (1,1 - 2,5)
1500 1/min 3,7 - 4,7 (3,5 - 4,9)

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 1 2
1. Edition

En

Testoil-ISO 4113

VE 6/10 F 2400 L 146-1

0 460 406 034

supersedes -
company VWW
engine: 087

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/.

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,8-3,2	mm		
1.2 Supply pump pressure	1500	5,2-5,8	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes		2,0 (3,0)
1.5 Start	100	min. 35	cm³/1000 strokes		
1.6 Full-load speed regulation	2700	6,0-12,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	750	750	1500	1500	2400
	mm	0,2-1,0(0-1,3)	(*)	(2,3-3,7)	(*)	5,7-6,5(5,4-6,8)
2.2 Supply pump	n = rev/min	600	*1500		2400	
	bar (kgf/cm²)	2,8-3,4	6,3-6,9		7,7-8,3	
Overflow delivery	n = rev/min	600			2400	
	cm³/10 s	55-138(40-153)			55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2825	max. 3,0	
	2700	(5,0-13,0)	
	2400	22,0-24,0(20,7-25,3)	
	1500	(26,7-31,3)	
	750	26,0-29,0(24,5-30,5)	
switch-off mech.	2400	0	
elektr.	400	0	
Idle stop	375	(4,0-12,0)	
	600	max. 4,0	
End stop	400	min. 20	
	500	max. 25	

2.4 Solenoid — max. cut-in voltage xxx min. 10 V; test voltage xxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment mm

Designation	mm
K	3,2-3,4
KF	6,4-6,7
MS	1,5-1,7
SVS	3,6
A	
B	

Observations

Please note instructions on sheet 2.

10.83

A15 AAS

* Test hydr. cold-start accelerator:
  At the designated points do not apply voltage to magnet of hydr. cold-start accelerator.
  750 1/min 1,2 - 2,4 (1,1 - 2,5)
  1500 1/min 3,7 - 4,7 (3,5 - 4,9)

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 RAB 9,7 a 1

1. Edition

En

PES 6 A 95 D 410 RS 2108 RSV 450-1000 A 1 B 2004 DL

Komb.-Nr. 0 400 876 266

supersedes -
company Raba
engine -

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7-1,8 (1,65-1,85) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2 (2)	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	11,1+0,1	10,8 - 11,0	0,3(0,6)			
450	5,9-6,1	1,1 - 1,7	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

(1) Upper rated speed rev/min — Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed — Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 34	450	5,5	1000	11,1-11,2
	x = 4,5						100	min.19,0	800	12,5-12,7
							450	5,9-6,1	500	12,6-12,8
ca. 59	10,1	1040-1050					535-595	= 2,0		
(2a)	4,0	1085-1115					650	max. 1,0		
	1200	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitation, Note changed to) rev/min 3	(3a) Fuel delivery characteristics rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle (5) rev/min 6	cm³/1000 strokes 7	(4a) Idle stop rev/min 8	Control rod travel mm 9
1000	107,5-109,5 (105,5-111,5)	1040-1050*	800	124,5-129,0 (122,5-131,0)	-	-	450	5,9-6,1
			500	125,5-129,5 (123,5-131,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

BOSCH Geschaftsbereich KH Kundendienst Kfz-Ausrustung

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 TOP 19,0 a
2. Edition

En

PE 12 A 85 D 610 RS 2141 RSV 200-1100 A1B 253 DL

supersedes 6.83
company Torpedo
engine T 519

Komb.-Nr. 0 400 670 005

1-12- 4- 9 - 2 - 11- 6 - 7 - 3 - 10- 5 - 8
0-45-60-105-120-165-180-225-240-285-300-345° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,4+0,1	8,7-8,8	0,3(0,45)			
500	12,8+0,1	8,2-8,4				

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control lever deflection in degrees 7	Lower rated speed: rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.24	200	5,5	1000	12,4-12,5
	X =	6,0					100	min.19,0	500	12,8-12,9
							200	5,9-6,2	800	12,7-12,9
ca.55	11,4	1040-1050					420-480	= 2,0		
(2a)	4,0	1155-1185								
	1250	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes 7	(5) (4a) Idle stop: rev/min 8	Control rod travel mm 9
1000	86,5-87,5 (84,5-89,5)	1040-1050*	500	82,0-84,0 (80,0-86,0)	-	-	-	-
			700	87,5-90,5 (85,0-93,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

A18

A18

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 MB 5,7 q 2
11. Edition

En

PES 6 A 90 D 410 RS 2293 RSV 350-1300 A 0 B 783 L

supersedes 3.83
company Daimler-Benz
engine OM 352 A
110 kW (150 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-1,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque control valve) mm 6
1300	11,4-0,1	7,7-7,7	0,3(0,45)			
350	7,3-7,5	1,0-1,4	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0 x = 3,5	-	-	-	loose	350	7,4	1300	11,4-11,5
							100	min.19,0	800	11,7-11,8
							350	7,3-7,5	1050	11,5-11,7
ca.62	10,0	1340-1350					570-	630=2,0		
(2a)	4,0	1460-1490								
	1600	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40 C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limiter, Note changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1340-1350*	LDA	0,7 bar	100	78,0-88,0	-	-
1300	75,5.76,5		500	62,0-64,0		(75,0-91,0)		
	(73,5-78,5)			(59,5-66,5)		= 15,1 -		
LDA	0,7 bar		LDA	0 bar		15,5mm RV		
800	67,0-69,0		500	50,0-52,0				
	(64,5-71,5)			(47,5-54,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 6 A .. RS 2293 +RSV..A0B 783 L	0,7	0	11,7-11,8
		0,39	10,7-10,8
		0,28	11,4-11,5
			10,9-11,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Testing the hydraulic start-locking device

Locking at 0,40 - 0,50 bar
Unlocking at 0,15 - 0,25 bar

Test Specifications Fuel Injection Pumps and Governors

Testoil-ISO 4113

40

WPP 001/4 MB 5,7 q

3. Edition

En

PES 6 A 90 D 410 RS 2293 EP/RSV 350-1400 AO B1080DL(1)
RS2293 350-1425 A2 B1028DL(2)
RS2293 350-1400 AO B 745L (3)
RS2293Z 350-1400 AO B 745L (4)

supersedes 4.78
company Daimler-Benz
engine OM352 (A)
92kW (125PS - 1-2)
115kW (156PS - 3)
123kW (168PS - 4)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	4,5 - 5,0	0,3(0,45)			
	6	1,8 - 2,6				
	12	7,3 - 8,2				
200	9	2,0 - 2,8				

Adjust the fuel delivery from each outlet according to the values in ____

B. Governor Settings

..1080DL (1)

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
ca.67	1400	16,0				ca.20	350	9,2	1380	0
	1450	11,4					100	19 - 21		
	1500	5,5	without auxoliary spring				350	8,9-9,5	600	0,2-0,3
	1470	8,0-10,4					500	3,6-6,2		
(5)	1520	3,8-6,8					700	0 - 1		
	1640	0,3-1,0	with auxiliary spring							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note changed to .. rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7 mm RW	(5a) Idle stop: rev/min 8	Control rod travel mm 9
(1) 1400	63,0 - 64,0 (61,0 - 66,0)	1450-1460*	600	51,0 - 53,0 (49,0 - 55,0)	100	14,7-15,3		
					1520	1540 = 4,0		

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany

MB5,7q
1028DL (2)

B. Governor Settings

(1) Upper rated speed			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.60	1425 1500 1560	16,0 11,5 6,5	without auxiliary spring			ca.20	350	7,5	1400	0
							200	19 - 21		
							350	7,2-7,8	800	0
	1500 1600 1760	10,0-12,2 3,8-6,0 0,3-1,0	with auxiliary spring				600 780	1,0-4,5 0 - 1	450	0,4-0,6
(5)										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop		(6) Rotational-speed limitat	(3a) Fuel delivery characteristics		Starting fuel delivery idle		(5a) Idle stop	
Test oil temp 40°C (104°F)		Note changed to rev/min						Control rod travel mm
rev/min	cm³/1000 strokes		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes XXXXXXXXXXX mm RW	rev/min	
1	2	3	4	5	6	7	8	9
(2) 1400	60,0 - 61,0 (58,0 - 63,0)	1450-1460*	500 (6a)	46,0 - 48,0 (44,0 - 50,0)	100	14,7-15,3		

Checking values in brackets

* 1 mm less control rod travel than col 2

745L (3 - 4)

B. Governor Settings

(1) Upper rated speed			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.63	1400 1500 1580	16,0 9,8 3,8	without auxoliary spring			ca.29	350	7,9		
							200	19 - 21		
							350	7,6-8,2		
ca.61	1400 1525 1650	ca. 11,9 ca. 4,6 0,3-1,0	with auxiliary spring				500 700	3,1-5,5 0 - 1		
(5)										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop		(6) Rotational-speed limitat	(3a) Fuel delivery characteristics		Starting fuel delivery idle		(5a) Idle stop	
Test oil temp 40°C (104°F)		Note changed to rev/min						Control rod travel mm
rev/min	cm³/1000 strokes		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	
1	2	3	4	5	6	7	8	9
(3) 1380	74,5 - 75,5 (72,5 - 77,5)	1420-1430*			100	78,0-88,0 (75,0-91,0)	350	7,9
(4) 1380	75,5 - 76,5 (73,5 - 78,5)	1420-1430*						

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP C01/4 MB 5,7 q 8
2. Edition
En

PES 6 A 90 D 410 RS 2293 RSV 350-1200 A0B 1101-1 L
Komb.-Nr. 0 400 876 316

supersedes 7.83
company Daimler-Benz
engine OM 352
70 kW (95 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,[illegible]-2,25 (2,10-2,30) mm from BDC RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1200	8,4-8,5	4,5-4,6	0,3(0,45)			
350	7,1-7,3	0,8-1,2	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800 x = 4,0	0,3-1,7	-	-	-	-	350	7,2	1200 600	8,4-8,5 9,8-9,9
ca.65 (2a)	7,4 4,0 1400	1225-1235 1290-1320 -1,7					350 475-535	7,1-7,3 = 2,0	800 1000	9,5-9,7 8,9-9,2

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note charged to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1200	45,0-46,0 (43,0-48,0)	1225-1235*	600	45,0-47,0 (43,0-49,0)	100	78,0-88,0 (75,0-91,0) = 14,9 - 15,3 mm RW	-	-

Checking values in brackets

* : mm less control rod travel than col 2

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Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 MB 5,7 q 3
7. Edition
En

PES 6A 90D 410RS 2293 RSV 350-1300A0B1105DL
Komb.-Nr. 0 400 876 260

supersedes 6.83
company Daimler-Benz
engine OM 352
92 kW(125PS)(1)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,10-2,30) / 2,15-2,25 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1300	9,5-9,6	6,2-6,3	0,3(0,45)			
350	7,4-7,6	1,2-1,6	0,2(0,45)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0	-	-	-	ca.28	350	5,9	1300	9,5- 9,6
	x	= 6,0					100	min.19,0	800	10,2-10,4
							350	7,4-7,6		
ca.68	8,5	1340-1350					470-530	= 2,0	500	10,3-10,4
(2a)	4,0	1430-1460								
	1550	0,3- 1,7					700	max.1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full load stop: Test oil temp. 40 C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational speed limit at: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5): Idle rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1300	62,5 - 63,5 (60,5 - 65,5)	1340-1350*	800	60,0-62,0 (58,0-64,0)	100	80,0-90,0 13,7-14,3 mm RW	-	-
			500	54,0-56,0 (52,0-58,0)				

Checking values in brackets

* [illegible] control rod travel than col. 2

12.83

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 5,7 q 6
3. Edition
En

PES 6 A 90 D 410 RS 2293-1 RSV 350-1400 AOB 745-1L
Komb.-Nr. 0 400 876 312

supersedes 8.82
company Daimler-Benz
engine OM 352 A
115 kW (156 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1380	11,9+0,1	7,6 - 7,7	0,3(0,45			
350	7,8-8,0	0,9 - 1,5	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ____

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 29	350	7,4	-	-
	X	= 4,25					100	min. 19,0		
ca. 61	10,9	1420-1430					350	7,8-8,0		
(5)	4,0	1530-1560					550-6	10= 2,0		
	1700	0,3- 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat: Note: changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
1380	75,5-76,5 (73,5-78,5)	1420-1430*	600	63,0-66,0 (61,0-68,0)	100	88,0-98,0 (85,0-101,0) = 16,3-16,7 mm KW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
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CA

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 3,8 g 2
4. Edition

En

Testoil-ISO 4113

PES 4 A 90 D 410 RS 2294 RQV 300-1425 AB 740 L
Komb.-Nr. 0 400 844 047

supersedes 8.83
company Daimler-Benz
engine OM 314
62,5 kW (85 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,1 - 2,3) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1400	9,7-9,8	6,3 - 6,4	0,3(0,45)			
300	7,5-7,7	0,9 - 1,5	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1420	15,2-17,8	-	-	-	ca.14	100 300	min.9,1 7,5-7,7	250 640 1030 1425	0,7-1,0 3,2-3,6 5,5-5,7 8,1
ca.61	8,7 4,0 1700	1455-1465 1550-1580 0 - 1,0				370-520 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	[illegible] 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1400	62,5 - 63,5 (60,5 - 65,5)	1455-1465 *	-	-	100	13,7-14,3 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 KHD 1 d

3. Edition

En

PE 6 A 95 D 410 LS 2450 RQ..929,930,984D,986D,987D	Supersedes	2.78
PE 8 A 95 D 410 LS 2451 RQV..898,931,973,974,975,976,983D,	Company	K H D
PE 10A 95D610/4 LS 2452 988D,990D,996,999,1006D,1009,	Engine	F 6 L 413 F/ FW
PE 12A 95D 610 LS 2453 1014,1016,1020,1021,1026D		8
Instructions P. 2 EP/RSV..1002D, 1084		10
		12

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning of the control valves mm 6
1000	9	7,5 - 8,0	0,4			
	6	3,2 - 4,2				
200	6	0,5 - 1,4				

Adjust the fuel delivery from each outlet according to the values in ▭

B. Governor Settings

(1) Upper rated speed rev/min — Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed — Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
	See page 3-8									
(2a)										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full load stop — Test oil temp. 40 C (104 F) rev/min 1	cm³/1000 strokes 2	(6) Rotational speed limitation — Note changed to ... rev/min 3	(3a) Fuel delivery characteristics rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle (5) rev/min 6	cm³/1000 strokes 7	(4a) Idle stop rev/min 8	Control rod travel mm 9
See page 9 - 22								

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.83

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INSTRUCTIONS

1. Contents

2. Cam sequence and angular cam spacing

6 cyl. 1 - 6 - 5 - 4 - 3 - 2 - 1
0 - 75 - 120 - 195 - 240 - 315 - 360°

8 cyl. 1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 - 1
0 - 45 - 90 - 135 - 180 - 225 - 270 - 315 - 360°

10 cyl. 1 - 10 - 9 - 4 - 3 - 6 - 5 - 8 - 7 - 2 - 1
0-27-72-99-144-171-216-243-288-315-160°

12 cyl. 1 - 4 - 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12 - 1
0-15-60-75-120-135-180-195-240-255-300-315-360°

3. Instructions for testing

to Section B:

Torque control dimension a = .. -section C, column 8 as required for trials no. for pre-adjustment. Final dimension to be set according to fuel-delivery characteristics in Section C, column 4-5. Further instructions for trials no. will follow on a separate information sheet.

to Section C:

If supplied, the control-rod stop with RQV governors must be set with a torque control of n= 600/min.

B. Governor Settings

RQ..

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point		Test specifications		Setting point		Test specifications			
rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12

300 1325 AB 929L, 930L

650	15,6-16,0	650	16,0	1350 1400 1440 1500	15,6-16,0 5,0-12,2 0 - 7,0 0 - 1,5	580	0	200 300 400 480	6,4-8,1 4,4-6,5 1,2-3,5 0	-	-

Torque-control travel on flyweight assembly dimension a = - mm Speed regulation At 1 mm less control rod travel

300/1250 AB 929L

650	15,6-16,0	650	16,0	1270 1300 1350 1420	15,6-16,0 10,0-14,8 0 - 8,0 0 - 1,5	580	0	200 300 400 480	6,3-8,1 4,2-6,2 0,8-3,2 0	-	-

Torque-control travel on flyweight assembly dimension a = - mm Speed regulation At 1 mm less control rod travel

300/1250 AB984DL, 987DL

650	15,6-16,4	650	16,0	1290 1320 1340 1420	13,0-15,4 6,0-13,7 0 - 10 0	570	0	200 350 410 470	6,5-8,1 2,8-5,0 0,6-3,2 0	750 900	15,8-16,0 15,3-15,6

Torque-control travel on flyweight assembly dimension a = 0,2 mm Speed regulation At 1 mm less control rod travel

300/1250 AB986DL

650	15,6-16,4	650	16,0	1300 1320 1340 1420	11,0-15,0 6,4-12,5 0 - 9,6 0	660	0	200 300 410 560	6,1-8,2 4,0-6,0 0 -2,4 0	800 950	15,6-15,9 15,0-15,4

Torque-control travel on flyweight assembly dimension a = 0,3 mm Speed regulation At 1 mm less control rod travel

Torque-control travel on flyweight assembly dimension a = mm Speed regulation At 1 mm less control rod travel

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
300-1325 AB 898L										
ca. 68	1350 1430 1520 1600	15,0-18,0 8,3-13,0 0 - 6,6 0	-	-	-	ca.12	200 300 500 890	7,5-9,0 4,9-7,1 2,7-4,2 0	250 800 1350 -	0,3-1,2 3,6-4,1 8,2 -
300-1250 AB 898L										
ca. 68	1300 1380 1450 1540	14,5-17,6 6,8-12,4 0 - 7,2 0	-	-	-	ca.12	200 300 500 840	7,3-9,0 4,9-7,1 2,3-4,8 0	250 800 1290 -	0,3-1,3 3,4-4,2 8,2 -
300-1150 AB 898L										
ca.68	1160 1220 1290 1370	15,0-18,0 8,2-13,6 0 - 7,3 0	-	-	-	ca.12	200 450 650 800	7,3-9,0 2,7-4,1 0,7-1,8 0	250 1160 -	0,3-1,3 8,3 -
300-1075 AB 898L										
ca. 68	1160 1240 1320 1400	15,0-18,0 8,0-13,2 0 - 7,2 0	-	-	-	ca.12	200 300 500 710	7,5-9,0 5,1-7,0 1,1-2,4 0	250 700 1170 -	0,3-1,2 4,0-4,5 8,3 -
300/725-1075 AB 931L										
ca.68	1075 1100 1160 1220	15,0-17,3 11,0-15,4 0 - 7,4 0	ca.48	700 800 900 950	11,6-16,5 7,0-11,4 1,7- 4,5 0	ca.12	140 300 450 700 830	6,8-8,2 4,7-6,1 3,6-4,0 1,7-3,9 0	200 400 650 900 1075 -	0,?-0,8 1,9-2,1 1,9-2,6 4,6-5,2 8,5 -

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

300-800/100 AB 973DL — Torque control travel a = 0,7 mm

ca. 50	1180 1250 1300 1380	15,0-18,4 6,8-12,0 0 - 7,6 0	ca. 27	600 700 840 880	11,8-14,7 7,6-10,3 0 - 2,4 0	ca.13	150 250 420 530	8,4-11,5 5,7-8,8 0 - 3 0	200 600 1050 1170	0,5-1,2 3,2-3,6 7,4-7,6 8,3
									650 400	0 0,7

300-1325 AB 974 L

ca. 66	1325 1400 1480 1560	15,0-17,8 8,3-12,9 0 - 6,8 0	-	-	-	ca. 10	150 300 450 600 860	6,6-8,0 4,6-6,1 2,7-3,8 1,8-3,2 0	1325	8,3
									—	—

300-985/1325 AB 975L

ca. 68	1350 1420 1460 1560	12,0-16,0 4,4-11,0 0 - 8,0 0	ca. 61	900 1000 1100 1300 1380	12,4-15,3 5,4-8,1 0,5-1,0 0,5-1,0 0	ca. 12	100 250 400 600 710	6,8-8,0 5,6-7,2 3,3-4,8 0,8-2,2 0	460 1300	2,0-2,5 8,5
									—	—

RQV 300-1325 AB976L

ca. 68	1350 1700	15,2-17,8 0 - 1	-	-	-	ca. 12	100 300 400 500	min. 8 5,4-5,6 1,5-3,7 0 - 1	300 600 1350	1,2-1,3 4,4-4,6 8,3
ca. 59	1375 1475	9,4-10,4 2,7-4,6							-	-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel / Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

300-1250 AB983DL, 990DL — Torque control travel a = 0,5 mm

ca.66	1290	15,0-18,0	-	-	-	ca. 12	100	7,6-8,6	1290	8,3
	1370	7,5-12,7					300	5,2-6,6		
	1440	0 - 7,7					600	2,0-3,2	1200	0
	1530	0					850	0	600	0,5-0,6

300-1075 AB988DL — Torque control travel a = 0,5 mm

ca. 68	1100	15,0-18,0	-	-	-	ca. 12	100	6,2-8,0	1100	8,3
	1190	4,1-10,4					300	4,4-6,2		
ca. 66	1075	15,0-18,0					500	1,8-3,3	1075	0
	1140	8,0-13,0					720	0	500	0,5-0,6
	1200	0 - 8								
	1280	0								

RQV 300-1075 AB988DL — Torque control travel a = 0,5 mm

ca. 68	1160	15,0-18,0	-	-	-	ca. 12	200	7,5-9,0	250	0,3-1,2
	1240	8,0-13,2					300	5,1-7,0	700	4,0-4,5
	1320	0 - 7,2					500	1,1-2,4		
	1400	0					710	0	1080	0
									500	0,5-0,6

RQV 1150 AB999L (V13274)

ca.48	1100	14,6-20,5	-	-	-	-	-	-	1150	5,4
	1150	8,3-13,0								
	1200	0 - 4,5							—	—

RQV 300-1000 AB1006DL (V13121D) — Torque control travel a = 0,5 mm

ca. 68	1100	14,0-17,6	-	-	-	ca.12	200	7,5-8,9	250	0,3-1,1
	1180	6,2-12,0					300	4,5-7,0	600	3,8-4,4
	1250	0 - 6					450	1,0-2,3	1080	8,2
							650	0		
									1000	0
									600	0,5-0,6

RQV 300/525-750 AB1009L (V13157)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel / Torque-control travel	
Degree of deflection of control lever	Control rod travel rev/min	Control rod travel mm	Degree of deflection of control lever	Control rod travel rev/min	Control rod travel mm	Degree of deflection of control lever	Control rod travel rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	760 800 815 850	15,0-18,4 4,2-11,0 0 -8,0 0	ca. 52	525 600 650 700	14,0-20,0 7,9-12,2 3,0-6,2 0	ca.12	175 300 400 500	7,1-8,2 4,0-6,3 3,6-4,0 0	250 400 600 760	0,3-1,2 1,9-2,1 3,7-4,5 8,3
									–	–

RQV 300-800/1325 AB1014L

ca.46	1330 1420 1500 1590	18,0-21,6 9,2-14,8 0 - 8 0	ca.30	600 720 840 880	11,9-14,3 6,6-9,0 0 -2,3 0	ca.10	100 300 400 510	9,4-12,2 4,1-7,9 0 - 3 0	150 700 1020- 1300 1330	0,8-1,4 4,0-4,4 7,4-7,6 7,8
									-	-

RQV 300/800-1150 AB1016L (V12264), 1021 (V13155)

ca.66	1160 1200 1250 1310	15,0-18,4 8,4-13,8 0 - 7,6 0	ca.48	760 850 950 1030	11,2-16,4 7,6-11,8 2,8-5,6 0	ca.12	200 450 650 900	6,1-7,7 3,6-4,0 3,3-4,0 0	250 400- 600 1160	0,5-1,2 1,9-2,1 8,2
									-	-

RQV 300/650-900 AB1020L (V12263)

ca.66	910 980 1020	15,0-18,4 0 - 7,5 0	ca.48	610 700 790 810	11,6-16,5 6,0-9,8 0 -2,0 0	ca.12	200 400 600 720	6,8-8,2 3,6-4,6 1,8-4,0 0	250 450- 500 910	0,3-1,0 1,9-2,1 8,3
									-	-

RQV 300-1250 AB1026DL Torque control travel a = 0,5 mm

ca.68	1300 1380 1450 1540	14,5-17,6 6,8-12,4 0 - 7,2 0	-	-	-	ca.12	200 300 500 840	7,3-9,0 4,9-7,1 2,3-4,8 0	250 800 1290	0,3-1,3 3,8-4,2 8,2
									1250 500	0 0,5-0,6

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel / Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

300-1325 A8 B 1084L

ca.69	1325 1400 1450	16,0 7,7 1,0				ca.23	300	6,0	1300	0
	1370 1430 1550	10,4-12,3 2,8-6,0 0,3-1,0	without auxiliary spring with auxiliary spring				100 300 450 600	19,0-21,0 5,7-6,3 0,8-2,9 0 -1,0	350	1,2-1,8

300-1000 A7 B1002DL

ca.72	1000 1030 1070	16,0 12,6 5,4				ca.23	300	6,0	980	0
	1050 1100 1200	7,0-10,2 2,0-4,4 0,3-1,0	without auxiliary spring with auxiliary spring				100 300 400 550	19 - 21 5,7-6,3 3,0-4,4 0 - 1	400	0,8-1,0

300-1325 A8 B1002DL

ca.69	1325 1380 1420	16,0 10,2 5,4				ca.25	300	6,0	1300	0
	1330 1370 1520	ca.10,5 ca. 9,5 0,3-1,0	without auxiliary spring with auxiliary spring				150 300 500 700	19 - 21 5,7-6,3 1,7-3,8 0 - 1	450	0,8-1,0

C. Settings for Fuel Injection Pump with Fitted Governor

Testoil-ISO 4113

Full load delivery Test oil temp 40°C (104 F)		Rotational-speed limitation RQV / Control rod stop RQ		Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm³/1000 strokes		rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes
1	2		3	4	5	6	7
F 6 L 413 F - 141kW/192PS / 2650/min							
1325	91,5-93,5	RQ:	600	1000	88,5-91,5	100	119-129
		RQV:	1340	800	87,5-90,5		
F 8 L 413 F - 188kW/192PS / 2650/min							
1324	91,5-93,5	RQ:	600	1000	88,5-91,5	100	119-129
		RQV:	1340	800	87,5-90,5		
F 10 L 413 F - 236kW/320PS / 2650/min							
1325	91,5-93,5	RQ:	600	1000	88,5-91,5	100	119-129
		RQV:	1340	800	87,5-90,5		
F 12 L 413 F - 284kW/384 PS / 2650/min							
1325	91,5-93,5	RQ:	600	1000	88,5-91,5	100	119-129
		RQV:	1340	800	87,5-90,5		

Caution: These changed values apply to governors without torque control

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Test oil temp 40°C (104 F)		Rotational-speed limitation RQV / Control-rod stop RQ	Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes
1	2	3	4	5	6	7
192 PS / 2650 min		**- RQ 300/1325 AB 929 L**				
1325	91,5-93,5	600	400 max. 84,5		100	119-129
192 PS / 2500 min		**- RQ 300/1250 AB 987 DL**				a = 0,2 mm
1250	91,5-93,5	600	700	92,5-94,5	100	119-129
			400	82,5-88,5		
186 PS / 2500 min		**- RQ 300/1250 AB 929 L**				
1250	94,5-96,5	600	400 max. 84,5		100	119-129
176 PS / 2500 min		**- RQ 300/1250 ABV 12946 D**				a = 0,3 mm
1250	85,5-87,5	600	1000	83,5-86,5	100	119-129
			700	86,5-89,5		
168 PS / 2500 min		**- RQ 300/1250 ABV 12946 D**				a = 0,3 mm
1250	75,5-77,5	600	1000	73,5-76,5	100	119-129
			700	71,5-74,5		
176 PS / 2300 min		**- RQ 300/1150 ABV 12242 D**				a = 0,35 mm
1150	83,5-85,5	600	1000	81,5-84,5	100	119-129
			700	85,5-88,5		
160 PS / 2150 min		**- RQ 300/1075 ABV 12243 D**				a = 0,35 mm
1075	82,5-84,5	600	1000	80,5-83,5	100	119-129
			700	83,5-86,5		

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C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	a	

1. 141kW/192 PS / 2650/min - RQV 300-1325 AB974L, 300-950/1325 AB975L

1325	91,5-93,5	1365-1375*	400	max.84,5	100	119-129	

2. 141kW/192 PS/2500/min - RQV 300-1250 AB 13392D, 300-800/1250 ABV13776D

1250	91,5-93,5	1290-1300*	1000	91,0-94,0	100	119-129	a = 0,5mm 770=4,5 (nur 13776D)
			700	91,5-94,5			

3. 137kW/186 PS/2500/min - RQV 300-1250 ABV12248

1250	90,5-92,5	1290-1300*	400	max.84,5	100	119-129	

4. 130kW/176 PS/2500/min - RQV 300-1250 AB983DL (V13122D) a = 0,5 mm

1250	85,5-87,5	1290-1300*	1000	83,5-86,5	100	119-129	
			400	78,5-82,5			

5. 107kW/145 PS/2400/min - RQV 300-1200 ABV 12259D a =

1250	71,5-73,5	1240-1250*	1000	68,0-71,0	100	119-129	
			700	67,0-70,0			

6. 124kW/168PS / 2300/min - RQV 300/800-1150 AB1021L (V12155)

1150	84,5-86,5	1190-1200*			100	119-129	

7. 124kW/168 PS/2300/min - RQV 300-1150 AB999L (V13274)

1150	85,5-87,5	1190-1200*			100	119-129	
					1196	17- 20	

8. 101kW/137 PS / 1800/min - RQV 300-900 ABV13156

900	79,5-81,5	940-950*	400	max.82,5	100	119-129	

9. 101kW/137 PS/1800/min - RQV 900 ABV 13273

900	80,5-82,5	910	936	17 - 20	100	119-129	

10. 90kW/116 PS / 1500/min - RQV 300/525-750 AB1009L (V13157)
RQV 750 ABV12507

750	78,5-80,5	790-800*	400	max.76,5	100	119-129	

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Checking values in brackets

* 1 mm less control rod travel than col 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp. 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

1. 141 kW/192 PS / 2650/min - EP/RSV 300-1325 A 8 B 1084 L

1325 91,5-93,5 1365-1375* 400 max. 82,5 100 119-129

2. 141kW/192PS / 2650/min - EP/RSV 300-1325 A 8 B 1002 DL

1325 91,5-93,5 1365-1375* 400 max. 82,5 100 119-129

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F 6 L 413 FW

6.1. 121kW/165PS / 2500/min - RQV 300-1250 ABV 13925D a = 0,5 mm
2. 108kW/147PS / 2500/min

1. 1250 79,5-81,5 1290-1300* 800 78,0-81,0 100 119-129
2. 1250 74,5-76,5 1290-1300* 800 71,0-74,0 100 119-129

7.1. 115kW/156PS / 2300/min - RQV 300-1150 ABV 13926 D a = 0,5 mm
2. 96kW/131PS / 2300/min

1. 1150 78,5-80,5 1190-1200* 800 78,0-81,0 100 119-129
2. 1150 68,5-70,5 1190-1200* 800 68,0-71,0 100 119-129

8.1. 101kW/137PS / 2150/min - RQV 300-1075 ABV 13927 D a = 0,5 mm
2. 91kW/124PS / 2150/min

1. 1075 73,5-75,5 1115-1125* 800 74,0-77,0 100 119-129
2. 1075 67,5-69,5 1115-1125* 800 68,0-71,0 100 119-129

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Checking values in brackets

* 1 mm less control rod travel than col. 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle Switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

1. 188kW/256PS / 2650/min - RQ 300/1325 AB 929 L (V 11708)

1325	91,5-93,5	600	400	max. 84,5	100	119-129		

2. 188kW/256PS / 2500/min - RQ 300/1250 AB 987 DL (V 13391 D) a = 0,2 mm

1250	91,5-93,5	600	700	90,5-93,5	100	119-129		
			400	82,5-88,5				

3. 183kW/248PS / 2500/min - RQ 300/1250 AB 929 L (V 12241)

1250	91,5-93,5	600	400	max. 84,5	100	119-129		

4. 173kW/235PS / 2500/min - RQ 300/1250 ABV 12946 D a = 0,3 mm

1250	85,5-87,5	600	700	83,5-86,5	100	119-129		
			400	max. 84,5				

5. 173kW/235PS / 2300/min - RQ 300/1150 ABV 12242 D a = 0,35 mm

1150	87,5-89,5	600	1000	88,0-91,0	100	119-129		
			700	88,0-91,0				
			400	max. 84,5				

6. 157kW/213PS / 2150/min - RQ 300/1075 ABV 12243 D a = 0,3 mm

1075	82,5-84,5	600	1000	81,5-84,5	100	119-129		
			700	84,5-87,5				
			400	max. 84,5				

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Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1. 188kW/256PS / 2650/min		- RQV 300-1325 AB 974 L (12247), 976 L (12630) AB 1014 L (13605), 13629 (→ 1014)						
1325	91,5-93,5	1365-1375*	400 max.	84,5	100	119-129	770	=4,5mmRW
2. 188kW/256PS / 2500/min		- RQV 300-1250 AB 990 DL (V 13392 D), 14020 D RQV 300-800/1250 ABV 13776 D a = 0,5 mm						
			1000	91,0-94,0				
1250	91,5-93,5	1290-1300*	700	91,5-94,5	100	119-129		
3. 183kW/248PS / 2500/min		- RQV 300-1250 AB 974 L (V 12248)						
1250	90,5-92,5	1290-1300*	400 max.	84,5	100	119-129		
4. 173kW/235PS / 2500/min		- RQV 300-1250 AV 983 DL (V 13122 D) a = 0,5 mm						
1150	85,5-86,5	1290-1300	1000	83,5-86,5	100	119-129		
			700	86,5-89,5				
5. 173kW/235PS / 2300/min		- RQV 300-1150 ABV 13777 D a = 0,5 mm						
1150	84,5-86,5	1190-1200*	1000	82,5-85,5	100	119-129		
			700	86,5-89,5				
6. 165kW/224PS / 2300/min		- RQV 300/800-1150 AB 1021 L (13155)						
1150	84,5-86,5	1190-1200*	400 max.	84,5	100	119-129		
7. 165kW/225PS / 2300/min		- RQV 1150 AB 999 L (V 13274)						
1150	85,5-87,5	1160			100	119-129		
					1196	17- 20		
8. 165kW/225PS / 2200/min		- RQV 300-800/1100 AB 973 DL (V 13230 D) a = 0,7mm						
1100	85,5-87,5	1140-1150*	1000	84,0-87,0	100	119-129		
			700	90,0-93,0				
9. 132kW/180PS / 2150O/min		- RQB 300-1075 ABV 13944 D a = 1,2						
1075	71,5-73,5	1115-1125*	1050	70,0-73,0	100	119-129		
			800	83,0-86,0				
10. 134kW/182PS / 1800/min		- RQV 300/650-900 ABV 13156						
900	79,5-81,5	910	400 max.	83,5	100	119-129		

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
11. 134kW/182PS / 1800/min - RQV 900 ABV 13273								
900	80,5-82,5	910			100	119-129		
					936	17- 20		
12. 114kW/155PS / 1500/min - RQV 300/525-750 AB 1009 L (V 13157)								
750	78,5-80,5	760	400	max. 82,5	100	119-129		
13. 114kW/155PS / 1500/min - RQV 750 ABV 12507								
750	78,5-80,5	760			100	119-129		
F 8 L 413 FW								
16. 1. 162kW/220 PS / 2500/min - RQV 300-1250 ABV 13925 D								a = 0,5 mm
2. 144kW/196 PS / 2500/min								
1. 1250	79,5-81,5	1290-1300*	800	78,0-81,0	100	119-129		
2. 1250	74,5-76,5	1290-1300*	800	71,0-74,0	100	119-129		
17. 1. 153kW/208 PS /2300/min - RQV 300-1150 ABV 13926 D								a = 0,5 mm
2. 129kW/175 PS /2300/min								
1. 1150	78,5-80,5	1190-1200*	800	78,0-81,0	100	119-129		
2. 1150	68,5-70,5	1190-1200*	800	68,0-71,0	100	119-129		
18. 1. 135kW/184 PS /2150/min RQV 300-1075 ABV 13927 D								a = 0,5 mm
2. 121kW/164 PS /2150/min								
1. 1075	73,5-75,5	1115-1125*	800	74,0-77,0	100	119-129		
2. 1075	67,5-69,5	1115-1125*	800	68,0-71,0	100	119-129		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1. 188kW/256PS / 2650/min			- EP/RSV 300-1325 A 8 B 1084 L					
1325	91,5-93,5	1365-1375*	400	max.84,5	100	119-129		
2. 188kW/256PS / 2500/min			- EP/RSV 300-1325 A 8 B 1002 DL					
1325	91,5-93,5	1365-1375*	400	max.84,5	100	119-129		
3. 147kW/200PS / 1900/min			- EP/RSV 300-1000 A 7 B 1002 DL A 7 C 1002 DL					
950	79,5-81,5	990-1000*	700 400	80,5-83,5 max. 84,5	100	119-129		
4.								
5.								
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10.								

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1. 236kW/320PS / 2650/min			- RQ 300/1325 (V11709)					
1325	91,5-93,5	600	400	max. 84,5	100	119-129		
2. 236kW/320PS / 2500/min			- RQ 300/1250 AB984DL					a = 0,2 mm
1250	91,5-93,5	600	1000	91,0-94,0	100	119-129		
			700	91,5-94,5				
3. 228kW/310PS / 2500/min			- RQ 300/1250 ABV12244					
1250	89,5-91,5	600	400	max. 84,5	100	119-129		
4. 217kW/295PS / 2500/min			- RQ 300/1250 AB986DL (V12159D)					a = 0,3 mm
1250	86,5-88,5	600	1000	84,5-87,5	100	119-129		
			700	87,5-90,5				
5. 216kW/293PS / 2300/min			- RQ 300/1150 ABV12245D					a = 0,35 mm
1150	84,5-86,5	600	1000	82,5-85,5	100	119-129		
			700	86,5-89,5				
6. 197kW/267PS / 2150/min			- RQ 300/1075 ABV12246D					a = 0,35 mm
1075	83,5-85,5	600	1000	81,5-84,5	100	119-129		
			700	84,5-87,5				
7.								
8.								
9.								

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1. 236kW/320PS / 2650/min		- RQV 300-1325 AB898L (V12249) 300-800/1325 ABV12271						
1325	91,5-93,5	1365-1375	400	max. 84,5	100	119-129		
2. 228kW/310PS / 2550/min		- RQV 300-1275 ABV13664D						a = 0,5 mm
1275	90,5-92,5	1315-1325*	1000	90,5-92,5	100	119-129		
			700	91,0-94,0				
3. 236kW/320PS / 2550/min		- RQV 300-1250 AB1026DL						a = 0,5 mm
1250	91,5-93,5	1290-1300*	1000	91,0-94,0	100	119-129		
			700	90,0-93,0				
4. 228kW/310PS / 2500/min		- RQV 300-1250 AB898L (V11962)						
1250	90,5-92,5	1290-1300*	400	max. 84,5	100	119-129		
5. 217kW/295PS / 2500/min		- RQV 300-1250 ABV13118D						a = 0,5 mm
1250	86,5-88,5	1290-1300*	1000	84,5-87,5	100	119-129		
			700	87,5-90,5				
6. 193kW/262PS / 2500/min		- RQV 300/850-1250 ABV12294						
1250	79,5-81,5	1290-1300*	400	max. 82,5	100	119-129		
7. 216kW/293PS / 2300/min		- RQV 300-1150 AB988DL (V13119D)						a = 0,5 mm
1150	84,5-86,5	1190-1200*			100	119-129		
			700	83,0-86,0				
			400	75,0-79,0				
8. 216kW/293PS / 2300/min		- RQV 300/800-1150 AB1016L (V12264)						
1150	84,5-86,5	1190-1200*	400	max. 82,5	100	119-129		
9. 206kW/280PS / 2300/min		- RQV 300-1150 AB898L						
1150	79,5-81,5	1190-1200*	400	max. 82,5	100	119-129		
10. 197kW/267PS / 2150/min		- RQV 300-1075 AB988DL (V13120D)						a = 0,5 mm.
1075	83,5-85,5	1115-1125*	1000	81,5-84,5	100	119-129		
			700	84,5-87,5				
			400	max. 82,5				

Checking values in brackets

* 1 mm less control rod travel than col 2

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C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

11. 197kW/267PS / 2150/min - RQV 300/750-1075 AB931L (V12575)

1075 83,5-85,5 1115-1125* 400 max. 82,5 100 119-129

12. 184kW/250PS / 2000/min - RQV 300-1000 AB1006DL (V13121D) a = 0,5 mm

1000 80,5-82,5 1040-1050* 700 83,5-86,5 100 119-129

13. 184kW/250PS / 2000/min - RQV 300-1000 ABV13550

1000 80,5-82,5 1040-1050* 400 max. 82,5 100 119-129

14. 168kW/228PS / 1800/min - RQV 300/650-900 AB1020L (V12263)

900 80,5-82,5 940-950* 400 max. 82,5 100 119-129

15. 142kW/193PS / 1500/min - RQV 300/525-750 AB998L (V12262)

750 78,5-80,5 790-800* 400 max. 82,5 100 119-129

F 10L 413 FW

16. 1.202kW/275PS / 2500/min - RQV 300-1250 ABV13928D a = 0,5 mm
2.180kW/245PS / 2500/min

1. 1250 79,5-81,5 1290-1300* 800 78,0-81,0 100 119-129
2. 1250 74,5-76,5 1290-1300* 800 71,0-74,0 100 119-129

17.1.192kW/261PS / 2300/min - RQV 300-1150 ABV13929D a = 0,5 mm
2.161kW/219PS / 2300/min

1. 1150 78,5-80,5 1190-1200* 800 78,0-81,0 100 119-129
2. 1150 68,5-70,5 1190-1200* 800 68,0-71,0 100 119-129

18.1.168kW/228PS / 2150/min - RQV 300-1075 ABV13930D a = 0,5 mm
161kW/219PS/ 2150/min

1. 1075 73,5-75,5 1115-1125* 800 74,0-77,0 100 119-129
2. 1075 67,5-69,5 1115-1125* 800 67,0-70,0 100 119-129

Checking values in brackets

* 1 mm less control rod travel than col 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp 40° C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

1. 283kW/384PS / 2650/min - RQ 300/1325 AB930L (V11709)

1325	91,5-93,5	600	400	max. 84,5	100	119-129	

2. 283kW/384PS / 2500/min - RQ 300/1250 AB984DL (V13407D) a = 0,2 mm

1250	91,5-93,5	600	1000	91,0-94,0	100	119-129	
			700	91,5-94,5			
			400	82,5-88,5			

3. 274kW/372PS / 2500/min - RQ 300/1250 AB930L (V12244)

1250	89,5-91,5	600	400	max. 84,5	100	119-129	

4. 260kW/353PS / 2500/min - RQ 300/1250 AB986DL (V13159D) a = 0,3 mm

1250	86,5-88,5	600	1000	84,5-87,5	100	119-129	
			700	87,5-90,5			
			400	max. 82,5			

5. 259kW/352PS / 2300/min - RQ 300/1150 ABV 12245D a = 0,35 mm

1150	84,5-86,5	600	1000	82,5-85,5	100	119-129	
			700	86,5-89,5			
			400	max. 82,5			

6. 236kW/320PS / 2150/min - RQ 300/1075 ABV12246D a = 0,35 mm

1075	83,5-85,5	600	1000	81,5-84,5	100	119-129	
			700	84,5-87,5			
			400	max. 82,5			

Checking values in brackets

* 1 mm less control rod travel than col 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp. 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

1. 283kW/384PS / 2650/min - RQV 300-1325 AB898L (V12249)

1325	91,5-93,5	1365-1375*	400	max. 84,5	100	119-129	

2. 283kW/384PS / 2500/min - RQV 300-1250 AB1026DL (V13408D) a = 0,5 mm

1250	91,5-93,5	1290-1300*	1000	91,0-94.0	100	119-129	
			700	91,5-94,5			

3. 274kW/372PS / 2500/min - RQV 300-1250 AB898L

1250	89,5-91,5	1290-1300*	400	max.84,5	100	119-129	

4. 260kW/353PS / 2500/min - RQV 300-1250 ABV 13118D a = 0,5 mm

1250	86,5-88,5	1290-1300*	1000	84,5-87,5	100	119-129	
			700	87,5-90,5			
			400	max. 82,5			

5.1 246kW/335PS / 2500/min
5.2 147kW/200PS / 2500/min - RQV 300-1250 ABV 13287D a = 0,55 mm

1250	82,5-84,5	1290-1300*	1000	80,5-83,5	fuel overquantity		
			700	84,0-87,0			
1250	50,5-52,5		1000	50,0-53,1	100	119-129	
			700	39,0-42,0			

6. 243kW/330PS / 2500/min - RQV 300-1250 ABV 13621D a = 0,5 mm

1250	78,5-80,5	1290-1300*	1000	77,0-80,0	100	119-129	
			700	73,0-76,0			

7. 259kW/352PS / 2300/min - RQV 300-1150 AB898L, 1016L (V12264)

1150	84,5-86,5	1190-1200*	400	max. 82,5	100	119-129	

8. 259kW/352PS / 2300/min - RQV 300-1150 AB988DL (V12118D) a = 0,5 mm

1150	84,5-86,5	1190-1200*	1000	82,5-85,5	100	119-129	
			700	86,5-89,5			
			700	86,5-89,5			

9. 247kW/336PS / 2300/min - RQV 300-1150 AB962L

1150	83,5-85,5	1190-1200*	400	max. 82,5	100	119-129	

10. 236kW/320PS / 2150/min - EQV 300/750-1075 AB931L (V12575)

1075	83,5-85,5	1190-1200*	400	max. 82,5	100	119-129	

Checking values in brackets

* 1 mm less control rod travel than col 2

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C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full load delivery Control rod stop Test oil temp. 40°C (104 F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
11. 236kW/320PS / 2150/min		- RQV 300-1075 AB988DL (V12120D) ABV13162D						a = 0,5mm
1075	83,5-85,5	1115-1125*	1000	81,5-84,5	100		119-129	
			700	84,5-87,5				
			400	max. 82,5				
12. 199kW/270PS / 2150/min		- RQV 300-1075 ABV13945D						a = 1,2mm
1075	71,5-73,5	1115-1125*	1050	70,5-72,5	100		119-129	
			800	83,0-86,0				
13. 221kW/300PS / 2000/min		- RQV 300-1000 AB1006DL (V12121D) ABV13163D						a = 0,5 mm
1000	80,5-82,5	1040-1050*	700	83,5-86,5	100		119-129	
14. 200kW/272PS / 2000/min		- RQV 300-1000 ABV 13550						
1000	80,5-82,5	1040-1050*			100		119-129	
15. 202kW/275PS / 1800/min		- RQV 300-900 ABV13549 300/650-900 ABV 12263						
900	80,5-82,5	940-950*			100		119-129	
16. 171kW/232PS / 1500/min		- RQV 300-750 AB998L (V12262)						
750	80,5-82,5	790-800*	400	max. 82,5	100		119-129	
F12 L 414 FW								
17.1-243kW/330PS / 2500/min 2-216kW/294PS / 2500/min		- RQV 300-1250 ABV13928 D						a = 0,5 mm
1. 1250	79,5-81,5	1290-1300*	800	78,0-81,0	100		119-129	
2. 1250	74,5-76,5	1290-1300*	800	71,0-74,0				
18.1-230kW/313PS / 2300/min 2-193kW/262PS/ 2300/min		- RQV 300-1150 ABV13929D						a = 0,5 mm
1. 1150	78,5-80,5	1190-1200*	800	78,0-81,0	100		119-129	
2. 1150	68,5-70,5	1190-1200*	800	68,0-71,0				
19.1-202kW/274PS / 2150/min 2-183kW/248PS / 2150/min		-RQV 300-1075 ABV13930D						a = 0,5 mm
1. 1075	73,5-75,5	1115-1125*	800	74,0-77,0	100		119-129	
2. 1075	67,5-69,5	1115-1125*	800	68,0-71,0				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MAN 16,0 g
1. Edition
En

PE 10 A 90 D 320 LS 2362 RQ 250/1250 AB 1170-2 R
Komb.-Nr. 0 400 649 228
1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4
0 - 27 - 72 - 99-144-171-216-243-288-315° ±0,5° (±0,75°)

supersedes-
company MAN
engine D 2538 M/MF
188 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 1,5 - 1,6 (1,45-1,65) mm (from BDC) Zyl. 10

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm³/100 strokes	cm³/100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1250	11,5+0,1	10,3-10,4	0,3(0,45			
250	7,4-7,6	0,9-1,5	0,25(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	15,6-16,4	600	16,0	10,5 4,0	1295-1310 1365-1395	250	6,0	100 250 360- 500	min.7,5 5,9-6,1 400=2,0 max.1,0	1250 600 870 970	11,5-11,6 12,1-12,2 11,9-12,1 11,5-11,8

Torque-control travel on flyweight assembly dimension a = 0,6 mm

Speed regulation At 1295-1310 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / Control rod travel mm
1	2	3	4	5	6	7
1250	102,5-103,5 (100,5-105,5)	-	800 500	95,5-98,5 (93,5-100,5) 90,0-94,0 (88,0-96,0)	100 250	133,0-143,0 (130,0-146,0) =18,3-19,3 mm RW 6,5 mm RW

Checking values in brackets

10.83

C1

Test Specifications Fuel Injection Pumps and Governors

(1) WPP 001/4 KHD 12,7 1
2. Edition
En

40

PE 8 A 95 D 410 LS 2451 RQV 300-1150 AB 1044 DL
Komb.-Nr. 0 400 648 116

1 - 8 - 7 - 2 - 6 - 5 - 4 - 3
0 -45 -90 -135-180-225-270-315° ±0,5° (±0,75°)

supersedes 9.82
company KHD
engine F 8 L 413 FW
153 kW (208 PS)
/ 2300 min-1
Change-over point

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) 2,00-2,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	9,-9,2	7,9 - 8,1	0,3(0,6)			
300	5,9-6,1	0,9 - 1,5	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.11	100	min.7,5	300	1,4-1,6
							300	5,9-6,1	750	4,0-4,3
							540-600	= 2,0		
ca.64	8,1	1190-1200					750	0,1	1190	8,5
	4,0	1225-1255								
	1350	0- 1,0 **				320-400 (3a)				

Torque control travel a = mm

** Set control-rod stop to contact at 600 min/!

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
1150	78,5-80,5 (76,5-82,5)	1190-1200*	800	77,5-81,0 (76,0-83,0)	100	119-129	1150	9,1-9,2
							350	9,4-9,6
							500	9,5-9,6
					100-220 (80-240)			

Checking values in brackets

* 1 mm less control rod travel than col 2

9.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

C2

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 KHD 4,1 c 2

1. Edition

En

supersedes

PES 4 A 80 D 410/3 RS 2523 RSV 325-1250 A 8 B 540-1 L

compare KHD F 4 L 913

Komb.-Nr. 0 400 864 058

engine Road-building machine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9-2,0 (1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,6+0,1	6,9-7,0	0,25(0,4)			
325	8,2-8,4	1,0-1,6	0,2 (0,35)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed: rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.17	325	6,5	1250	11,6-11,7
	X= 4,0						100	min.19,5	500	12,1-12,2
							325	6,9-7,1	965	11,8-12,0
ca.56	10,6	1290-1300					630-690	= 2,0		
(2a)	4,0	1390-1420								
	1555	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
250	68,5-69,5 (67,0-71,0)	1290-1300*	800	64,5-66,5 (62,5-68,5)	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

11.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

C3

C3

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 7,0 b 3

1. Edition

En

PE 6 P 110 A 320 RS 260 Z RSV 250-1250 PO/374/2 R

Komb.-Nr. 0 401 876 190

supersedes

company Volvo-P enta

engine TAMD 70 D
206 kW (280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testöl-HSO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	11,9+0,1	14,3-14,5	0,4 (0,8)			2,5 ± 0,1
250	5,9-6,1	1,1-1,5	0,25 (0,55)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 17	250	5,5	-	-
	x =	4,5					100	min. 20,0		
ca. 47	10,9	1295-1305					250	5,9-6,1		
(2a)	4,0	1340-1370					430-490	= 2,0		
	1450	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to : rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA	1,2 bar	1295-1305 *	LDA	0 bar	100	160,0-200,0	250	5,9-6,1
1000	143,0-145,0 (140,0-148,0)		1000	86,0-89,0 (83,0-92,0)		= 20,0 21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

C4

C4

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P .. RS 260 Z +RSV.. PO/374/2R	1,0	0,36	11,7 - 11,8 8,6 - 8,7

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

C5

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 FOR 5,9 d
4. Edition
En

PES 6 A 90 D 210 RS 2628 RSV 325-1200 AOB 2140 L
Komb.-Nr. 0 400 866 104 AOC 2140 L

supersedes 6.83
company Ford
engine Dover 363 T/C

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

At port closing the locating pin must engage in the slot of the pointer.

Port closing = prestroke 2,7-2,8 (2,65-2,85) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1175	11,5+0,1	8,4 - 8,5	0,3(0,45)			
350	5,1-5,3	0,5 - 1,1	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0	-	-	-	ca. 38	350	4,7	-	-
	X =	4,0					100	min. 19,0		
							350	5,1-5,3		
ca. 67 (5)	10,5	1240-1250					490-5	50= 2,0		
	4,0	1375-1405					625	max. 1,0		
	1540	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ... rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1240-1250 *	LDA	0 bar	100	76,0 - 90,0	-	-
1175	83,5-84,5		500	49,0 - 51,0		(73,0-93,0)		
	(81,5-86,5)			(47,0 - 53,0)		= 19,0-21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 1175 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure - bar	Measurement Gauge pressure - bar	Control rod travel - diminution / difference mm (1)
PES 6 A ..RS 2628 with..A0B 2140 L	0,7		11,5 - 11,6
		0	10,1 - 10,2
		0,48	11,1 - 11,2
		0,30	10,2 - 10,4

Notes

(1) when n rev/min and gauge pressure - bar (- maximum full-load control rod travel)

C7

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 KHD 1 g 3
6. Edition

En

PES 4 A 85 D 410/3 RS 2638 RSV 325-1150 A 8 B 2168 L
A8C 2168 L

supersedes 9.83
company KHD
engine BF 4 L 913
66 kW(90 PS)
/ 2300 min-1
tractor DX 92 (1)
60 kW (82 PS)
/ 2300 min-1
tractor DX 86 (2)
BF 4 L 913 T

Komb.-Nr. 0 400 864 054
1 - 3 - 4 - 2 je 90°±0,5° (- 0,75°)

Symbol S 29 =

Symbol S 28 =

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque control valve) mm 6
1150	11,8+0,1	8,2 - 8,3	0,3(0,45)	10,6+0,1	7,5 - 7,6	
325	7,7-7,9	0,9 - 1,5	0,2(0,4)	7,7-7,9	1,0 - 1,6	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0	-	-	-	ca.29	325	7,3	1150	11,8+0,1
	x =	4,0					100	min.19,5	500	12,3+0,1
ca.53							325	7,7-7,9	965	12,0+0,2
(2a)	10,8	1190-1200					700-760	= 2,0		
	4,0	1325-1355								
	1495	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full load stop, Test oil temp 40 C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
(1) 1150	82,0-83,0 (80,0-85,0)	1190-1200*	800	79,0-82,0 (76,5-84,5)	100	108,5-118,5 = RW 16,9 - 17,4mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.83

BOSCH Geschäftsbereich KH Kundendienst Kfz Ausrüstung
1980 by Robert Bosch GmbH Postfach 50 D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

The numbers denote the sequence of the tests

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever (1)	Control rod travel mm (2)	Control rod travel mm rev/min (3)	Intermediate rated speed (4)	(5)	(6)	(4) Control-lever deflection in degrees (7)	Lower rated speed: rev/min (8)	Control rod travel mm (9)	(3) Torque control: rev/min (10)	Control rod travel mm (11)
loose	800	0,3-1,0	-	-	-	ca.26	325	7,0	1150	10,5+0,1
	x =	4,0					100	min.19,0	500	11,2+0,1
ca.56	9,6	1220-1230					325	7,4-7,6	900	10,9+0,3
(2a)	4,0	1325-1355					720-780	= 2,0		
	1475	0,3-1,7								

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min (1)	cm³/1000 strokes (2)	(6) Rotational-speed limitat. Note: changed to ...) rev/min (3)	(3a) Fuel delivery charactenstics: rev/min (4)	cm³/1000 strokes (5)	Starting fuel delivery (5) Idle: rev/min (6)	cm³/1000 strokes (7)	(4a) Idle stop: rev/min (8)	Control rod travel mm (9)
(2) 1150	74,5-75,5 (72,5-77,5)	1220-1230*	800	65,5-68,5 (63,5-70,5)	100	108,5-118,5	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever (1)	Control rod travel mm (2)	Control rod travel mm rev/min (3)	Intermediate rated speed (4)	(5)	(6)	(4) Control-lever deflection in degrees (7)	Lower rated speed: rev/min (8)	Control rod travel mm (9)	(3) Torque control: rev/min (10)	Control rod travel mm (11)
(2a)										

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min (1)	cm³/1000 strokes (2)	(6) Rotational-speed limitat. Note: changed to ...) rev/min (3)	(3a) Fuel delivery characteristics: rev/min (4)	cm³/1000 strokes (5)	Starting fuel delivery (5) Idle: rev/min (6)	cm³/1000 strokes (7)	(4a) Idle stop: rev/min (8)	Control rod travel mm (9)

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

C9

C9

Test Specifications Fuel Injection Pumps and Governors (2)

WPP 001/4 KHD 9,5 b

1. Edition

En

PE 6 AM 80 B 310 RS 21 RQ 250/1075 A 314 D
RS 2002 A 386 D

supersedes 3.66
company KHD
engine F 6 L 714 A

"diesel" = flap touching
"gasoline" = flap free-standing

(→ .. A 314 D)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 ± 0,1 mm (from BDC)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm³/100 strokes	cm³/100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1000	12	7,4 - 7,8	0,4			
	9	3,9 - 4,7				
	15	10,3 - 11,4				
200	9	2,9 - 3,7				

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider PRG check (1)		Full-load speed regulation Setting point		Test specifications (4)		Idle speed regulation Setting point		Test specifications (5)		Torque control (3)	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1050	14,0-14,8	1050	14,4	1100	14,2-14,4	440	0	200	7,4-8,1	400	16,0-16,2
				1120	4,5-12,6			250	4,8-7,5	600	15,5-15,9
				1140	0 - 9,0			300	0,6-3,8	800	14,5-14,9
				1190	0			340	0		

Torque-control travel on flyweight assembly dimension a = 0,5 mm

Speed regulation At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery idle speed (6)	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	Control rod travel cm³/1000 strokes / mm
1	2	3	4	5	6	7
	(diesel)				100	mind. 9,9
1050	72,5 - 74,5		800	74,5 - 77,5		
	(gasoline)					
1050	78,5 - 82,5	400	600	75,0 - 78,0		

Checking values in brackets

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FiA 5,5 h
1. Edition
En

PES 6 MW 80/720 RS 1015 RQV 300-1600 MW 47

0 403 446 142

1 - 5 - 3 - 6 - 2 - 4
0 - 60-120-180-240-300

supersedes–
company Iveco-Fiat
engine 8060.24.670
121 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Tesoil ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,10-2,20 (2,05-2,25) mm (from BDC) RW 9 - 12 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 5
1000	11,2+0,1	6,0-6,2	0,35(0,6)			
300	7,3-7,4	1,05-1,45	0,35(0,55)			
1600	11,2+0,1		0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1640 1850	15,2-17,8 0 - 1,0				ca. 16	100 300	min.8,9 7,3-7,4		
ca. 64	10,2 4,0	1640-1650 1775-1805				330-800 (3a)				

Torque control travel a = mm

Test electrically unlocked starting delivery with 24 V.

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1000	60,0-62,0 (58,5-63,5)	1640-1650*	1600	69,0-73,0 (67,0-75,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

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CAA

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 5,5g
1. Edition

En

Testoil-ISO 4113

PES 6 MW 90/720 RS 1015 RQV 375-1600 MW 49
0 403 446 146

supersedes –
company: IVECO-Fiat
engine 8062.24.668
140 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	11,9+0,1	7,6-7,8	0,35(0,6)			
300	8,3+0,1	1,0-1,4	0,35(0,55)			
1600	11,9+0,1		0,5 (0,7)			
500	10,4+0,2					

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3 (1a, 2a)	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6 (4)	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9 (3)	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1640 1950	15,2-17,8 0-1,0				ca. 16	375 100	8,3-8,4 min.9,0		
ca.63	10,9 4,0	1640-1650 1810-1840				390-880 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b, 4a): rev/min 3	Fuel delivery characteristics high idle speed (5a, 5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1000	0,5 bar 76,0-78,0 (74,0-80,0)	1640-1650*	LDA 1600	0,5 bar 82,0-86,0 (80,0-88,0)	200	160,0-180,0 (157,0-183,0)		
			LDA 500	0 bar 42,5-44,5 (40,5-46,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure bar	Measurement Gauge pressure bar	Control rod travel - diminution difference mm (1)
RS 1015 with	0,5		11,9 - 12,0
RQV..MW 49		0	10,4 - 10,5
		0,21	11,5 - 11,6
		0,18	10,8 - 10,9

Notes

(1) when n rev/min and gauge pressure bar (maximum full load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 8,8k
5. Edition
En

Testoil-ISO 4113

PES 6 MW 100/320 RS 1016
RQV 300-1300 MW 25
Komb.-Nr. 0 403 446 123

supersedes 11.82
company RVI
engine MIDR06.02-12
125 kW (170 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port-closing mark 10,5° after port closing.

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW = 9,0 - 12,0

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	11,2+0,1	9,0-9,2	0,35(0,6)			
300	5,8-5,9	0,95-1,35	0,35(0,55)			
900	11,2+0,1		0,5 (0,7)			
500	10,0+0,1					

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1300 1600	15,2-17,8 0 - 1,0				ca. 13	200 300	max.7,5 5,9-6,0		
ca.62	10,2 4,0	1345-1355 1455-1585				340-600 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1300	0,67 bar 90,0-92,0 (88,0-94,0)	1345-1355*	LDA 900	0,67 bar 88,0-92,0 (86,0-94,0)	100 300	min. 100,0 9,5 - 13,5 (7,0 - 16,0)		
			LDA 500	0 bar 59,0-61,0 (57,0-63,0)	100-230 (80-250)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing ~~increasing~~ pressure – in bar gauge pressure
XXXXXX

Pump/governor	Setting	Measurement	Control rod travel	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
RS 1016 mit MW25	0,25		10,8 - 10,9	
		0,67	11,2 - 11,3	
		0	10,2 - 10,3	
		0,22	10,3 - 10,4	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors (1)

WPP 001/4 RVI 8,8 f
2. Edition

En

Testoil-ISO 4113

PES 6 MW 100/320 RS 1016 RQV 300-1400 MW 25-2

0 403 446 129

1 - 5 - 3 - 6 - 2 - 4
0 -60 -120-180-240-300
+

* Start of delivery mark is 8° after start of delivery at control-rod travel 10,5 mm

supersedes –
company RVI
engine MIDR 06.02-12
125 kW (170 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1400	11,1+0,1	9,1 - 9,3	0,35(0,6)			
300	5,8-5,9	0,95-1,35	0,35(0,55)			
900	11,1+0,1		0,5 (0,7)			
500	9,3+0,1		0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1400 1650	15,2-17,8 0-1,0	-	-	-	ca.13 (3a)	300 200	5,8-5,9 max.4,4		
ca. 62	10,1 4,0	1440-1450 1550-1580						490-550 = 2,0		

Torque control travel a = mm

C. Settings for Fuel injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1400	0,5 bar 91,0-93,0 (89,0-95,0)	1440-1450*	LDA 900 LDA 500	0,5 bar 86,5-90,5 (84,5-92,5) 0 bar 53,5-55,5 (51,5-57,5)	100	94,0-104,0 (91,0-107,0) 100-230 (80-250)		

Checking values in brackets

* 1 mm less control rod travel than col 2

10.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure - bar	Measurement Gauge pressure - bar	Control rod travel - diminution / difference mm (1)
RS 1016 with RQV..MW 25-2	0,12		9,8 - 9,9
		0,16	10,6 -10,7
		0	9,4 - 9,5
		0,5	11,1 -11,2

Notes

(1) when n rev/min and gauge pressure bar (maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 L

3. Edition

En

PES 6 MW 100/320 RS 1108
RQV 350-1300 MW 45

0 403 446 140

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

Test-pressure line
1 680 750 008

superseded 8.83
company IHC
engine DT 466 B
143,5 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test-No 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,7+0,1	9,55-9,75	0,35(0,6)			
350	5,9-6,0	1,6-2,0	0,35(0,55)			
1300	11,7+0,1		0,65(0,7)			
500	9,0-9,1					

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0	1440-1505	-	-	-	ca.14	100	min.9,0		
	0,1	1550					350	5,9-6,0		
ca.61,5	10,8	1360-1380				380-700				
± 2,5	4,0	1475-1485				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA	0,9 bar	1360-1380*	LDA	0,9 bar	100	RW 19-21		
900	95,5-97,5		1300	99,5-103,5		140-180		
	(93,5-99,5)			(97,5-105,5)		(137-183)		
			LDA	0 bar	350	16,0-20,0		
				52,5-54,5		(13,5-22,5)		
				(50,5-56,5)	220-280	(210-290)	Locking	
					100	(80)	Unlocking	

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting		Measurement		Control rod travel - diminution difference	
	Gauge pressure	bar	Gauge pressure	bar	mm	(1)
RS 1108 with MW 45	0,9				11,7 - 11,8	
			0		9,0 - 9,1	
			0,2		9,5 - 9,6	
			0,57		11,2 - 11,3	

Notes

(1) when n rev/min and gauge pressure bar (maximum full load control rod travel)

Notes:

- Carry out pump adjustment only with original overflow valve and IH hose with restriction of 1.2 mm diameter.
- Adjust locking prior to sleeve check.
- Do not drive at more than n = 500 1/min in unlocked condition.
- Set low idle at stop screw.
- Set shutoff stop 1.5 - 2.0 mm before stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 n
2. Edition
En

PES 6 MW 100/320 RS 1112
RQV 350-1300 MW 46
0 403 446 141
Test-pressure line
1 680 750 008

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes 9.83
company IHC
engine DTI-466 C
154,5 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Tested (C) 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10 (3,95-4,15) mm from BDC RW = 9,0 - 12,0

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	10,5+0,1	10,3-10,5	0,35(0,6)			
350	5,4-5,5	1,8-2,2	0,35(0,55)			
1300	10,5+0,1		0,65(0,6)			
500	8,4+0,1					

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 1a 2a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	8,0 0 - 1	1440-1505 1600	ca. 21±2,5	595-605	1,9-2,1	ca.14	100 350	min. 9,0 5,4-5,5		
ca.47,5 +2,5	4,0	1470-1480		435-465	7,9-8,1	370-650 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed 2b 4a rev/min 3	Fuel delivery characteristics 5a high idle speed 5b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm 9
LDA 900	0,9 bar 103,0-105,0 (101,0-107,0)		LDA 1300	0,9 bar 107,0-111,0 (105,0-113,0)	100	RW 19-21 140-180 (137-183)		
			LDA 500	0 bar 63,5-65,5 (61,5-67,5)	350	18,0-22,0 (15,5-24,5)		
					220-280 100	(210-290) (80)	Locking Unlocking	

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1112 mit MW 46	0,9 bar	0	10,5 - 10,6
		0,28	8,4 - 8,5
		0,51	9,0 - 9,1
			10,0 - 10,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

= Notes:

- Set pump only with original overflow valve and IH hose with restriction 1.3 mm diameter.
- Before testing the sleeve position, first set interlock.
- When unlocked, n = 500 1/min is maximum speed.
- Set low idle at stop screw.
- Set shutoff stop 1.5 - 2.0 mm before shutoff.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 PER 8,8 f
1. Edition

En

PES 8 MW 100/720 RS 1113 RQV 250-1400 MW 37-2

0 403 448 119

1 - 8 - 7 - 5 - 4 - 3 - 6 - 2
0 - 45- 90-135-180-225-270-315

supersedes

company Perkins
engine TV 8.5 40 M
242 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

FB mark is at RW 10.5 mm after FB and 17° NW

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW = 9 - 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1400	13,8+0,1	11,9-12,1	0,35(0,6)			
250	8,2-8,3	1,4-1,8	0,35(0,55)			
900	13,8+0,1		0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

Testoil-ISO 4113

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1400 1600	15,2-17,8 0 - 1,0				ca. 15	100 250	min.9,7 8,2-8,3		
ca. 64	12,8 4,0	1450-1460 1560-1590				270-500				
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1400	119,0-121,0 (117,0-123,0)	1450-1460*	900	115,0-119,0 (112,5-121,5)	100	90,0-100,0 (87,0-103,0)		
					250	14,0-18,0 (11,5-20,5)		
					100-180	(80-200)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 PEN 7,0 b
4. Edition
En

Testoil-ISO 4113

PE 6 P 110 A 320 RS 260
RS 260 Y

EP/RSV 250-1250 PO/374/2 R

supersedes 40.78
company Volvo-Penta
engine THAMD 70 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) (Checking tolerance $^{+0,15}_{-0,05}$)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm³/100 strokes	cm³/100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1000	12	14,3 - 14,8	0,6			2,5 ± 0,1 ** (max. 2,2-2,9)
600	9	8,0 - 9,2				
	12	14,7 - 16,4				
	15	20,2 - 22,3				
250	6	0,9 - 1,3	0,25			

Adjust the fuel delivery from each outlet according to the values in [ ]

** In case valve-spring spread is higher, change the initial tension accordingly.

B. Governor Settings

Upper rated speed			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.47	1250	16,0				ca.19	250	6,0	-	-
	1300	10,3								
	1330	6,3	without auxoliary spring				100	19-21		
							250	5,7-6,3		
(5)	1300	9,5-12,0					400	1,7-3,9		
	1360	3,2- 5,5					560	0 - 1		
	1460	0,3- 1,0	with auxiliary spring							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop		(6) Rotational-speed limitat	(3a) Fuel delivery characteristics		Starting fuel delivery idle		(5a) Idle stop	
Test oil temp. 40°C (104°F)		Note changed to						Control rod travel
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9
250	LDA 1,2 bar		LDA	0 bar				
1000	149,0-152,0	1295-1305*	1000	76,0 - 81,0	100	160 - 190		
					250	11 - 15	) **	
					Streug. max. 2,5			
(increase by 3,0 cm³)								./.

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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Testoil-ISO 4113

The numbers denote the sequence of the tests

B. Governor Settings

(1) Upper rated speed rev/min			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.47	1250 1300 1330	16,0 10,8 6,8	without auxiliary spring			ca.19	250	6,0	-	-
(2a)	1300 1360 1460	9,5-12,0 3,2- 5,5 0,3- 1,0	with auxiliary spring				100 250 400 560	19 - 21 5,7-6,3 1,7-3,9 0 - 1		

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F)		(6) Rotational-speed limitat Note changed to)	(3a) Fuel delivery characteristics		Starting fuel delivery Idle (5)		(4a) Idle stop	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
	LDA 1,2 bar		LDA	0 bar	100	160-190		
					250	11- 15		
260Y					dispersion max. 2,5 **			
1000	138,0-140,0	1295-1305*	1000	86,0-89,0				

Checking values in brackets

* 1 min less control rod travel than col 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel: diminution / difference mm (1)
260 with 374/2R	0,78 - 0,81	min 0,04	
260Y with 374/2R	1,00 - 1,03	0,14 - 0,27	

Notes

(1) when n = rev/min and gauge pressure = bar (maximum full-load control rod travel)

En

C24

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,4 a
4. Edition
En

Testoil-ISO 4113

PES 6 P 120 A 320 LS 429 RQV 250-1100 PA 582 (1)
RQ 250/1100 PA 581 (2)

supersedes 83
company MAN
engine D2566 MKUL 235 kW (320 PS)

Komb.-Nr. 0 402 046 223 (1)
0 402 046 222 (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95 -3,15) mm (from BDC) Zyl.6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	12,9 +0,1	22,0 - 22,4	0,5(0,9)			
250	6,2-6,4	1,2 - 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

RQV .. PA 582

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100	15,2-17,8				ca. 13	100	min.7,8	250	1,6-1,7
							250	6,2-6,4	500	4,0-4,3
ca. 68	10,4	1140-1150							800	5,5-5,7
	4,0	1225-1255				355-475			1100	8,1
	1400	0 - 1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes * 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm +0,1 9
LDA	1,0 bar	1140-1150*	LDA	1,0 bar	100	215,0-235,0	1100	11,4
750	220,0-224,0		1100	185,0-191,0	250	12,0- 18,0	750	12,9
	(217,0-227,0)		650	212,0-218,0			895	12,5
			LDA	0,29 bar			980	11,7
			500	138,0-144,0				
			LDA	0 bar				
			[illegible]	115,0-119,0				

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.83

* Checking tolerance ± 3 cm³

D1

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D1

B Governor Settings

Checking ... PRG ... (1)		Full-load speed regulation: Setting point			Test specifications (4)	Idle speed regulation: Setting point		Test specifications (5)		Torque control (3)	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	19,2-20,8	600	20,0	10,4	1145-1160	250	6,3	100	min.7,8	1100	11,4-11,5
				4,0	1185-1215			250	6,2-6,4	1005	11,7-12,0
VH = max. 46°										925	12,5-12,7
				1300	0 - 1,0			335-375=2,0mm		750	12,9-13,0

Torque control travel on flyweight assembly dimension a 0,55 mm Speed regulation at 1145 - 1160 min^{-1} 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full load delivery on governor control lever, Test oil temp. 40 °C (104 °F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery, idle speed (6)	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes *	rev/min	cm^3/1000 strokes / mm Control rod travel
1	2	3	4	5	6	7
LDA	1,0 bar	-	LDA	1,0 bar	100	215,0-235,0
750	220,0 - 224,0		1100	185,0 - 191,0		
	(217,0 - 227,0)		650	212,0 - 218,0		
			LDA	0,29 bar		
			500	138,0 - 144,0		
			LDA	0 bar		
			500	115,0 - 119,0		

Checking values in brackets

* Checking tolerance ± 3 cm^3

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min ~~decreasing~~ increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure bar	Measurement Gauge pressure bar	Control rod travel mm (1)
..LS 429 mit RQV..PA 582 und RQ..PA 581	1,0		12,9 - 13,0
		0	9,6 - 9,7
		0,29	10,5 - 10,6
		0,58	12,3 - 12,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

En

PES 6 P 120 A 720 LS 470-1 RQ 250/1100 PA 679
Komb.-Nr. 0 402 046 289
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes –
company MAN
engine D2866 KUL 265 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC Zyl. 6; RW=9,0-12,0 mm

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm³/100 strokes	cm³/100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
750	12,7+0,1	23,0-23,2	0,5(0,9)			
250	5,4-5,6	1,2-1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Full-load speed regulation Test specifications ④		Idle speed regulation Setting point		Idle speed regulation Test specifications ⑤		Torque control ③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	19,2-20,8	600	20,0	10,9	1145-1160	250	5,5	100 min.	7,0	750	12,7-12,8
VH= max. 46°				4,0	1185-1215			250	5,4-5,6	1100	11,9-12,0
				1350	0-1,0			320-360	=2,0	975	12,3-12,5
										1020	11,7-12,0

Torque-control travel on flyweight assembly dimension a = 0,4 mm

Speed regulation At 1145-1160 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	Control rod travel cm³/1000 strokes / mm
1	2	3	4	5	6	7
LDA 750	1,0 bar 230,0-232,0 (227,0-235,0)	–	LDA 500	0,4 bar 182,0-188,0 (179,0-191,0)	100	225,0-245,0 (221,0-249,0)
LDA 1100	1,0 bar 218,0-224,0 (215,0-227,0)		LDA 500	0 bar 128,0-130,0 (125,0-133,0)	250	12,0-18,0 (9,0-21,0)

Checking values in brackets

12.83

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure = in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel: diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 6 P..LS 470-1 +RQ..PA 679	1,0	0	12,7-12,8
		0,40	9,4-9,5
		0,19	11,2-11,3
			9,9-10,3

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

D4

D4

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 19,1 k

4. Edition

En

PE 12 P 110 A 320 LS 832 RQV 350-1150 PA 476 R

Komb.-Nr. 0 401 840 060

supersedes 4.82

company Daimler-Benz

engine OM 404 A

1- 5- 9- 8- 3 - 4 - 11- 10- 2 - 6 - 7 - 12

0-15-60-75-120-135-180-195-240-255-300-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test oil ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2-3,3 (3,15-3,35) mm (from BDC) 7y1. 12; RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	12,8+0,1	13,4-13,6	0,4(0,8)			
350	7,4-7,6	1,4-2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.18	100	min.8,6	300	0,9-1,1
ca.66	11,8	1185-1195					350	7,0-7,2	580	3,5-3,8
	4,0	1295-1325					615-675	= 2,0	870	5,2-5,5
	1450	0-1,0							1150	7,8
						(3a)				

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1185-1195*	LDA	0 bar	100	130,0-150,0	1130	12,8+0,1
	134,0-136,0		500	122,0-124,0		(126,0-154,0)	700	13,1+0,1
	(131,5-138,5)			(119,0-127,0)			970	13,0+0,1
			LDA	0,7 bar			1070	12,8+0,1
			700	136,0-140,0				
				(133,0-143,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure = in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel: diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 12 P...LS 832 + RQV..PA 476 R	0,70		13,1 - 13,2
		0	12,4 - 12,5
		0,39	12,9 - 13,0
		0,31	12,5 - 12,7

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

D6

D6

Test Specifications Fuel Injection Pumps ② and Governors

PE 12 P 110 A 520 LS 838 RQ 250-950 PA 583
Komb.-Nr. 0 401 840 076

supersedes –
company MAN
engine D 2542 MTE

1- 5- 9- 8- 3 - 4 - 11- 10- 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

TestoilISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
880	11,4+0,1	15,4-15,6	0,4(0,8)			
250	3,8-4,0	1,3-1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
550	15,6-16,4	550	16,0	10,4 4,0 1100	925-940 965-995 0-1,0	250	3,9	100 250 290-330	min.5,4 3,8-4,0 = 2,0	880 550	11,4-11,5 11,4-11,6

Torque-control travel on flyweight assembly dimension a = 0 mm

Speed regulation: At 965-995 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
880	154,0-156,0 (151,0-159,0)	-	-	-	100	150,0-170,0 (146,0-174,0)

Checking values in brackets

12.83

PE 10 P 110 A 520/4 LS 846 RQ 250/1150 PA 659-1
Komb.-Nr. 0 401 849 171

supersedes –
company MAN
engine D 2540 MT
323 kW (439 PS)

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil HSO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm³/100 strokes	cm³/100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1150	11,9+0,1	14,0-14,2	0,4(0,8)			
250	6,9-7,1	1,1-1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	19,2-20,8	600	20,0	10,9	1195-1210	250	7,0	100	min.8,5	1150	11,9-12,0
VH =	max. 46°			4,0	1300-1330			250	6,9-7,1	600	11,9-12,1
				1450	0-1,0			350-390	= 2,0		

Torque-control travel on flyweight assembly dimension a = 0 mm

Speed regulation At 1195-1210 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm³/–1000 strokes	rev/min	rev/min	cm³/–1000 strokes	rev/min	Control rod travel cm³/1000 strokes / mm
1	2	3	4	5	6	7
LDA	0,9 bar	–	LDA	0,9 bar	100	145,0-175,0
1150	140,0-142,0		750	134,0-138,0		
	(137,0-145,0)			(131,0-141,0)		
			LDA	0 bar		
			500	115,0-118,0		
				(112,0-121,0)		

Checking values in brackets

12.83

D8

D8

D. Adjustment Test for Manifold Pressure Compensator

Test at n 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel	Diminution difference
	Gauge pressure = bar	Gauge pressure - bar	mm (1)	
PE 10 P..LS 846	0,90		11,9 - 12,0	
+ RQ..PA 659-1		0	11,1 - 11,2	
		0,38	11,7 - 11,8	
		0,33	11,3 - 11,5	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

D9

(1)

Test Specifications Fuel Injection Pumps (1) and Governors

WPP 001/4 MAN 17,4 a 4
1. Edition

En

PE 10 P 110 A 520/5 LS 846   RQV 250-1000 PA 677
Komb.-Nr. 0 401 849 181

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ± 0,5° (± 0,75°)

supersedes
company MAN
engine D 2540 MTF 360
287 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10; RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,1+0,1	16,3-16,5	0,4(0,75)			
250	6,9-7,1	1,2-1,8	0,45(0,75)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel (1a) mm rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1080	15,2-17,8	-	-	-	ca.12 (3a)	100 250 400-460=2,0	min.8,5 6,9-7,1	350 800 1000	2,0-2,5 6,5-6,7 7,8
ca.63	11,2 4,0 1300	1040-1050 1170-1200 0-1,0								

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2) rev/min 1	cm³/1000 strokes 2	Rotational-speed (2b) limitation intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel rev/min 8	Control rod travel mm 9
LDA 700	1,0 bar 163,0-165,0 (160,5-167,5)	1040-1050*	LDA 1000 LDA 500	1,0 bar 149,0-153,0 (146,0-156,0) 0 bar 105,0-107,0 (102,5-109,5)	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

D10

D. Adjustment Test for Manifold Pressure Compensator

Test at n 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump governor	Setting	Measurement	Control rod travel: diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 10 P..LS 846	1,0		13,1 - 13,2
+ RQV..PA 677		0	10,4 - 10,5
		0,46	12,5 - 12,6
		0,23	11,0 - 11,4

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 17,4 a 3

1. Edition

En

PE 10 P 110 A 520/5 LS 846 RQV 250-1150 PA 673
Komb.-Nr. 0 401 849 180

supersedes

company MAN

engine D 2540 MT
323 kW

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ± 0,50° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test oil ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) 7y1 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9+0,1	14,0-14,2	0,4(0,8)			
250	6,9-7,1	1,1-1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1170	15,2-17,8	-	-	-	ca.12	100	min.8,5	350	2,0-2,5
							250	6,9-7,1	850	6,5-6,7
ca.65	10,9	1190-1200					400-460=2,0		1150	8,4
	4,0	1310-1340								
	1450	0-1,0				(3a)				

Torque control travel a = – mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1150	0,9 bar 140,0-142,0 (137,0-145,0)	1190-1200*	LDA 750	0,9 bar 134,0-138,0 (131,0-141,0)	100	145,0-175,0 (141,0-179,0)	-	-
			LDA 500	0 bar 115,0-118,0 (112,0-121,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement		Control rod travel - diminution difference	
	Gauge pressure = bar	Gauge pressure =	bar	mm	(1)
PE 10 P..LS 846	0,90			11,9 - 12,0	
+ RQV..PA 673		0		11,1 - 11,2	
		0,38		11,7 - 11,8	
		0,33		11,3 - 11,5	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

D13

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 20,9 q 1

1. Edition

En

PE 12 P 110 A 520/4 LS 848 RQV 250-1200 PA 668-4
Komb.-Nr. 0 401 840 094

1- 5- 9- 8- 3 - 4 - 11- 10- 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ±0,5°(±0,75°)

supersedes-
company MAN
engine D 2842 ME
338 kW
Schiff

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test of ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	11,9+0,1	12,5-12,7	0,4(0,8)			
250	7,0-7,2	0,9-1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1330	15,2-17,8	-	-	-	ca.12	100 250	min.8,6 7,0-7,2	350 950 1200	1,9-2,3 5,6-5,8 7,4
ca. 61	10,9 4,0 1500	1240-1250 1365-1395 0-1,0				425-550 (3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1200	125,0-127,0 (122,0-130,0)	1240-1250*	-	-	100	150,0-170,0 (146,0-174,0)	-	-
					250	9,0-15,0 (6,5-17,5)		

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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D14

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MAN 17,4 b 6

1. Edition

En

PE 10 P 110 A 520/5 LS 850 RQ 900 PA 663-2
Komb.-Nr. 0 401 849 173

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ±0,5°(±0,75°)

supersedes -
company MAN
engine D 2540 MTE
274 kW

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10; RW=9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	13,1+0,1	15,3-15,6	0,4(0,75)			
250	6,9-7,1	1,1-1,6	0,45(0,75)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider ① PRG check: Control rod travel mm 2	Full-load speed regulation: Setting point rev/min 3	Setting point Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	Test specifications rev/min 6	Idle speed regulation ⑤ Setting point rev/min 7	Setting point Control rod travel mm 8	Test specifications rev/min 9	Test specifications Control rod travel mm 10	Torque control ③ rev/min 11	Torque control Control rod travel mm 12
-	-	-	12,1 7,2 1000	900-905 932-946 0-1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 900-905 min^{-1} 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F): rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
850	153,0-156,0 (150,5-158,5)	-	-	-	-	-

Checking values in brackets

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

D15

DAF

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 17,4 b 4

1. Edition

En

PE 10 P 110 A 520/4 LS 850 RQV 250-1150 PA 668-5
Komb.-Nr. 0 401 849 176

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ±0,5°(±0,75°)

supersedes
company MAN
engine D 2540 MTE
323 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Technisch Alt!3

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9+0,1	14,1-14,3	0,4(0,8)			
250	6,9-7,1	1,1-1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1160	15,2-17,8	-	-	-	ca.12 (3a)	100	min.8,5	350	2,0-2,5
							250	7,2-7,4	900	6,8-6,9
ca. 65	10,9	1190-1200					405-465	=2,0	1150	8,4
	4,0	1310-1340								
	1450	0-1,0								

Torque control travel a = - mm

C. Settings for Fuel injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1150	141,0-143,0 (138,0-146,0)	1190-1200*	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

D16

D16

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 17,4 b 5
1. Edition

En

PE 10 P 120 A 520/S LS 850 RQV 250-1150 PA 668-6

supersedes
company MAN
engine D 2540 MLE 405 kW
Komb.-Nr. 0401849177

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ± 0.5° (± 0,75°)
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tuning 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,2+0,1	18,5-18,8	0,5 (0,9)			
250	6,2-6,4	1,2-1,8	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1230	15,2-17,8	-	-	-	ca. 11	100	min.7,8	350	2,0-2,5
							250	6,2-6,4	750	5,2-5,6
ca. 59	10,2	1190-1200					380-440	= 2,0	1150	7,5-7,9
	4,0	1260-1290							1250	8,8
	1400	0 - 1,0				③a				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm 9
LDA 1150	1,0 bar 185,0-188,0 (182,0-191,0)	1190-1200 *	LDA 500	0 bar 119,0-122,0 (116,0-125,0)	100	205,0-225,0 (201,0-229,0)	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

D17

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D. Adjustment Test for Manifold Pressure Compensator

Test at n 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump-governor	Setting	Measurement		Control rod travel	diminution difference
	Gauge pressure bar	Gauge pressure = bar		mm (1)	
PE10P.. LS 850 +RQV.. PA 668-6	1,0			11,2-11,3	
		0		9,6-9,7	
		0,65		10,8-10,9	
		0,54		10,0-10,3	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MAN 17,4 b 7
1. Edition
En

PE 10 P 110 A 520/5 LS 850 RQV 250-1150 PA 670-1
Komb.-Nr. 0 401 849 178

supersedes_
company MAN
engine D 2540 MTE
323 kW

1- 8- 7- 6- 3 - 5 - 2 -10 - 9 - 4
0-27-72-99-144-171-216-243-288-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test on ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9+0,1	14,0 - 14,3	0,4 (0,75			
250	7,0-7,2	1,1 - 1,6	0,45 (0,75			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever (3a) 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1170	15,2-17,8	-	-	-	ca. 12	100	min.8,6	350	2,0-2,5
ca. 65	10,9 4,0 1450	1190-1200 1310-1340 0 - 1,0					250 400-460	7,0-7,2 = 2,0	900 1150	6,8-6,9 8,4

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA 1150	0,7 bar 140,0-143,0 (137,5-145,5)	1190-1200 *	LDA 500	0 bar 115,0-117,0 (112,5-119,5)	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement		Control rod travel	Diminution / difference
	Gauge pressure = bar	Gauge pressure = bar		mm (1)	
PE 10 P.. LS 850 + RQV.. PA 670-1	0,7			11,9-12,0	
		0		11,0-11,1	
		0,38		11,6-11,7	
		0,34		11,2-11,4	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 IHC 13,4 e
1. Edition
En

PES 6 P 110 A 420 LS 3037 EP/RSV 350-1050 P2/425 DR

Values only apply to test nozzle-and-holder assembly
1 688 901 016 and fuel-injection test tubing 9 681 271 027

supersedes
company IHC
engine DTI-817 C
Komb.-Nr. 0 402 076 710

Testol-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Suction-gallery pressure 2,8 bar

Port closing at prestroke 2,0 - 2,1 (1,95-2,15) mm from BDC.

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pretensioning torque-control valve mm 6
1050	11,3+0,1	19,9-20,1	0,4			
350	4,6-4,7	2,0-2,5				

** With control lever in end position: increase speed until 4 mm control-rod travel is reached. Then adjust idle spring so that it maskes contact and screw out by one turn.

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever ° 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
lose	800	0,3-1,0	-	-	-			**	1050	11,3-11,4
						ca. 21	100	20,0-21,0	700	12,1-12,3
							200	11,0-21,0	550	12,1-12,3
ca.45	10,3	1090-1100					350	4,6		
(2a)	4,0	1145-1175					390-420	=2,0		
	1300	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40 C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) die stop: rev/min 8	Control rod travel mm 9
LDA	0,8 bar	1090-1100*	LDA	0,8 bar	100	180,0-205,0	-	-
1050	199,0-201,0		750	202,0-208,0				
	(197,0-203,0)			(199,0-211,0)	350	20,0-25,0		
			LDA	0 bar				
			800	145,0-153,0				
				(142,0-156,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.83

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D21

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 800 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump governor	Setting	Measurement	Control rod travel	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
PES6P..LS3037 EP/RSV..P2/425DR	0,19 - 0,25	Suction control-rod travel + 0,5 mm 0,49 - 0,52	10,8 - 10,9	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f¹
2. Edition

En

PE 6 P 120 A 320 RS 3071 ROV 250-1025 PA 371

supersedes 2.81
company Volvo
engine TD 120 GA

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6-2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4+0,1	20,5-20,8	0,5(0,9)			
250	5,6-5,7	2,2-2,6	0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in [redacted]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.12	100	min.7,1	250	1,1-1,2
ca.40	10,4	1065-1075					250	5,6-5,7	500	2,9-3,3
	4,0	1145-1175							800	5,1-5,4
	1300	0 - 1,0							1025	7,2
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 700	0,9 bar 205,0-208,0 (202,0-211,0)	1065-1075*	LDA 700	0 bar 157,0-161,0 (154,0-164,0)	100	230,0-270,0 =RW 20,0-21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump governor	Setting	Measurement	Control rod travel	Diminution difference
	Gauge pressure – bar	Gauge pressure – bar	mm	1 :
PE 6 P..RS 3071 +ROV.. PA 371	0,57		11,0-11,1	
		0,90	11,4-11,5	
		0	9,0-9,1	
		0,33	9,9-10,1	

Notes

(1) when n = rev/min and gauge pressure = bar = maximum full-load control rod travel

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 10,0 03
2. Edition
En

PE 6 P 110 A 320 RS 3080-1 RQV 250-1025 PA 589
Komb.-Nr. 0 401 846 768

supersedes 12.82
company Volvo
engine TD 100 FA
220 kW (299 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,45-3,15) mm (from BDC)= RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,2±0,1	17,9 - 18,1	0,4(0,8)			2,5 ± 0,1 (2,2 - 2,9)
250	4,3-4,5	1,7 - 2,1	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1090	15,2-17,8	-	-	-	ca. 9	100	min.5,8	200	0,7-0,9
ca. 64	12,2	1085-1095					250	4,3-4,5	475	3,9-4,5
	4,0	1160-1190							660	
	1300	0 - 1,0					315-375 = 2,0		bis 945	6,4-6,6
						(3a)			1025	7,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA	0,75 bar	1085-1095*	LDA	0,75 bar	100	150,0-200,0	-	-
700	179,0-181,0 (176,0-184,0)		1000	170,0-174,0 (167,0-177,0)		(146,0-204,0) = 20,0-21,0 mm RW		
			LDA 700	0 bar 130,5-133,5 (128,0-136,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

E1

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E 1

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE6P .. RS 3080-1	0,42		12,5 - 12, 6
+ RQV .. PA 589		0,75	13,2 - 13,3
		0	10,5 - 10,6
		0,26	11,4 - 11,6

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

E2

E2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 10,0 02
3. Edition
En

PE 6 P 110 A 320 RS 3080-1 RQV 250-1100 PA 589
Komb.-Nr. 0 401 846 769

supersedes 8.83
company Volvo
engine TD 100 F
220 kW (299 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95-3,15) mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,7+0,1	17,9 - 18,1	0,4(0,8)			2,5 ± 0,1
250	3,8-4,0	1,7 - 2,1	0,3(0,6)			(2,2 - 2,9)

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 1a 2a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 4 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3 9	Sliding sleeve travel 1: rev/min 10	mm 11
max.	1180	15,2-17,8	-	-	-	ca. 8	100	min. 5,3	200	0,7-0,9
ca. 63	11,7	1160-1170					250	3,8-4,0	500	4,2-4,8
	4,0	1235-1265					305-365	= 2,0	600 bis 1040	6,4-6,6
	1350	0 - 1,0				3a			1100	7,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) 2: rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed 2a 4a: rev/min 3	Fuel high idle speed 5a 5b: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point 6: rev/min 6	cm³/1000 strokes 7	Torque-control travel 5: rev/min 8	Control rod travel mm 9
LDA	0,75 bar	1160-1170*	LDA	0,75 bar	100	150,0-200,0	-	-
700	179,0-181,0 (176,0-184,0)		1000	170,0-174,0 (167,0-177,0)		= 20,0-21,0 mm RW		
			LDA 700	0 bar 130,5-133,5 (127,5-136,5)				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

E3

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F3

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE6P .. RS 3080-1	0,42		12,0 - 12,1
+ RQV .. PA 589		0,75	12,7 - 12,8
		0	9,9 - 10,0
		0,26	10,8 - 11,0

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

E4

E4

Test Specifications Fuel Injection Pumps and Governors ②

WPP 001/4 MB 14,6 a
4. Edition
En

Testoil-ISO 4113

PE 8 P 110 A320 LS 3802 RQ 300/1150 PA 437 (1)
RQV 300-1150 PA 486 (2)

supersedes 80
company Daimler-Benz
engine OM 422
206 Kw (280 Ps)

Komb.-Nr. 0 401 848 708 (1)
0 401 848 712 (2)

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,95-4,15) 4,00-4,10 mm (from BDC) Zyl.8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,7-12,8	12,1 - 12,3	0,4(0,8)			
300	8,5-8,7	1,1 - 1,7	0,4(0,7)			
600	-	C, Sp.4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ - 437

Checking of slider PRG check: ① Control rod travel mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
13,8-14,6	600	14,0	11,7	1195-1210	300	8,6	100	min.10,1	1150	12,7-12,8
			4,0	1250-1280			300	8,5-8,7	1025	12,8-13,0
0 - 1,0							420-470=2,0		600	13,0-13,1

Torque-control travel on flyweight assembly dimension a = 0,2 mm

Speed regulation: At 1195-1210 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1150	121,0 - 123,0 (118,0 - 126,0)	600	600	117,0 - 121,0 (114,0 - 124,0)	100	130,0-150,0

Checking values in brackets

12.83

E5

B. Governor Settings

Upper rated speed				Intermediate rated speed			Lower rated speed				Sliding sleeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min (1a) (2a)		Degree of deflection of control lever	rev/min	Control rod travel mm (4)	Degree of deflection of control lever	rev/min	Control rod travel mm (3)	rev/min	mm (1)
1	2	3		4	5	6	7	8	9	10	11
ca.68	1150 1400	15,2-17,8 0 - 1					ca.21	100 300	min.10,1 8,5-8,7	300 450	1,7 3,0-3,3
ca.66	11,7 4,0	1190-1200 1245-1275						735	795=2,0	1200	8,4
							(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2)		Rotational-speed limitation (2b) intermediate speed (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	121,0-123,0 (118,0-126,0)	1190-1200*	600	117,0-121,0 (114,0-124,0)	100 100-220	130,0-150,0 (80-240)	1150 900 600	12,7-12,8 12,7-12,9 12,8-13,0

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

Upper rated speed				Intermediate rated speed			Lower rated speed				Sliding sleeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min (1a) (2a)		Degree of deflection of control lever	rev/min	Control rod travel mm (4)	Degree of deflection of control lever	rev/min	Control rod travel mm (3)	rev/min	mm (1)
1	2	3		4	5	6	7	8	9	10	11
							(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2)		Rotational-speed limitation (2b) intermediate speed (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min		rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 21,9 b 1
2. Edition

En

PE 12 P 120 A 320 LS 3819-2 ROV 350-1050 PA 493

1-5 -9 - 8 - 3 - 4 -11-10 - 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ±0,5 (±0,75)
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes 2.83
compact Daimler-Benz OM 424 A
engine 357 kW (485 PS)

Komb.-Nr.
0 401 840 711

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 -4,1 (3,95-4,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,2+0,1	15,1-15,3	0,5(0,8)			
350	4,6-4,8	1,2- 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15.2-17.8	-	-	-	ca.10	100	min.6,2	300	0,9-1,1
							350	4,6-4,8	550	3,4-3,6
ca. 56	9,2	1085-1095							800	4,7-4,9
	4,0	1165-1195							1050	6,8
	1350	0 - 1,0				360-500 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA 1050	0,6 bar 151,0-153,0 (148,0-156,0)	1080-1090*	LDA 1050 **	0,6 bar 120,0-123,0 (117,0-126,0)	100	140,0-160,0 (136,0-164,0)	-	-
			LDA 500	0 bar 128,0-130,0 (125,0-133,0)				

Checking values in brackets

** Set at the reduced-delivery stop.

* 1 mm less control rod travel than col 2

10.83

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E7

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 12 P..LS3819-2 +ROV..PA 493	0,28	0,60	9,9-10,0
		0	10,2-10,3
		0,24	9,5-9,6
			9,6-9,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 59,2 a
2. Edition
En.

PE 6 ZW 140/400 RS 27/2, 53/2
PE 6 ZW 140/410/3 RS 28/2, 54/2 RQUV 300-750 ZW 31
1 - 5 - 3 - 6 - 2 - 4 je $60^{o} \pm 0{,}5^{o}$ ($\pm 0{,}75^{o}$)
VDT-W-400/305 Please note instructions on sheet 2

Replaces 2.83
Firm: MTU
Engine: MMB 820

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,0-2,1 mm (from BDC) Cyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	491,0-501,0	15,0 (22,0)	487,0-505,0	
600	4,0	70,0-90,0	10,0 (15,0)	67,0-93,0	
250	4,0	23,0-43,0	8,0 (12,0)	20,0-46,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 85	750	21,5-23,5	-	-	-	ca. 19	270	11,0-13,0	-	-
	775	13,0-18,0					300	7,6-8,0		
	800	5,0-12,0					325	5,0-6,2		
	840	0-3,0					350	4,8		
	865	0					400	3,3-4,3		
							540	0		

Torque control travel a = - mm Speed regulation: At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
750	21 mm RW	-	-	-	-	-

Checking values in brackets

11.83

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Pump

With these pumps the customer also requests that the stop and full load limits of the control-rod projection be stamped on the pump housing at contol-rod travel 0 mm.
These dimensions, which must be stamped in, can be calculated as follows:

Mark control-rod travel 18 mm (setting point of the pump) with insertion device. Calculate the projection of the control rod front end on pump side 2. Deduct 18 mm from the dimension calculated. Calculate the projection of the control rod with forked piece fitted on pump side 1. Add 18 mm to this dimension. Stamp these dimensions on the front of the pump housing above the spring chamber cover (with plunger-and-barrel assembly 1 the dimension of pump side 1 and with plunger-and-barrel assembly 6 that of pump side 2). Size of figures approx. 5 - 6 mm.

After the insertion device has been removed the 0-dimension calculated on pump side 2 must be reached or not reached in the stop position of the control rod.

On pumps with governor ascertain only the dimension on the drive end and stamp this on the housing.

Governor

The lower idle spring must be positioned between its spring seats, and if necessary also the middle spring must be positioned under the outer spring seat, so that the governor specifications are reached.

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 19,9 a 1

1. Edition

En.

Replaces

Firm

Engine MTU MB 6 V 331

PE 6 ZW 150/120 RS 70/11 RQU 250-350/1100 ZWA 46 DR

Komb.-Nr. 0 402 436 033

1- 2- 3 - 4 - 5 - 6

0-45-120-165-240-285° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	
600	9,0	125,0-145,0	16,0 (24,0)	120,0-156,0	-
300	9,0	37,0-57,0	10,0 (15,0)	33,0-61,0	
1100		C Sp. 2			
350		C Sp. 5	12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control min 10	Control-rod travel mm 11
ca.58	650	18,0	ca.27	150	14,1-16,4	ca.21	150	11,1-13,2	-	-
	1100	17,5-18,0		220	10,2-11,8		220	8,0-8,7		
	1150	11,7-16,0		350	7,4-7,6		250	7,6-7,8		
	1200	3,0-10,0		500	2,0-2,7		400	2,7-4,5		
	1280	0-1,0		650	2,0		520	0		
				1000	1,8-2,0					
				1160	0					

Torque control travel a = - mm Speed regulation. At 1130-1140 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Fuel-delivery characteristics min 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
1100	279,0-285,0 (276,0-288,0)	-	350	42,0-48,0	100	17,8-18,2 mm RW (17,5-18,5)
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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E11

Test specifications Fuel injection pumps and governors

..PP 001/4 MTU 19,9 a

En. 3. Edition

PE 6 ZW 150/120 RS 70/11 Z RQU 250-350/1100 ZWA 43 DR

Replaces
Firm 4.72
Engine MTU MB 6 V 331

Komb.-Nr. 0 402 436 032

1- 2- 3 - 4 - 5 - 6
0-45-120-165-240-285° ± 0,5° (± 0,75°)
Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) ZW 1. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	125,0-145,0	16,0 (24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0 (15,0)	33,0-61,0	
1100		C Sp. 2			
350		C Sp. 5	12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.58	650	18,0	ca.27	150	14,1-16,1	ca.21	150	11,0-14,2	-	-
	1100	17,5-18,0		200	10,4-12,5		220	8,0-8,6		
	1150	11,7-16,0		350	7,4-7,6		250	7,6-7,8		
	1200	3,0-10,0		500	2,0-2,7		400	2,6-4,3		
	1280	0-1,0		650	2,0		520	0		
				1000	1,8-2,0					
				1160	0					

Torque control travel a = - mm Speed regulation At 1130-1140 min⁻¹ (rpm) less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1100	318,0-324,0 (315,0-327,0)	-	350	42,0-48,0	100	17,8-18,2 mm RW (17,5-18,5)
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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EAL

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 g

1. Edition

En.

PE 8 ZW 150/120 RS 74/11 ROU 250-350/1100 ZWA 46 DR

Komb. Nr. 0 402 438 011

Replaces

Firm MTU

Engine MB 8 V 331

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ±0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60(2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	
600	9,0	125,0-145,0	16,0(24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0(15,0)	33,0-61,0)	
1100		C Sp 2			
350		C Sp 5	12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min 2	Control-rod travel mm min⁻¹ 3	Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	min 8	Control-rod travel mm 9	min 10	Control-rod travel mm 11
ca.58	650	18,0	ca.27	150	14,1-16,4	ca.2	150	11,1-13,2	-	-
	1100	17,5-18,0		220	10,2-11,8		220	8,0-8,7		
	1150	11,7-16,0		350	7,4-7,6		250	7,6-7,8		
	1200	3,0-10,0		500	2,0-2,7		400	2,7-4,5		
	1280	0 - 1,0		650	2,0		520	0		
				1000	1,8-2,0					
				1160	0					

Torque control travel a = - mm

Speed regulation: At 1130-1140 min⁻¹ - mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm³/1000 strokes 2	min 3	min⁻¹ 4	cm³/1000 strokes 5	min 6	cm³/1000 strokes 7
1100	279,0-285,0 (276,0-288,0)	-	350	42,0-48,0	100	17,8-18,2 mm RW (17,5-18,5)
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

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E13

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 g 1
1. Edition
En.

PE 8 ZW 150/120 RS 74/11 Z RQU 250-350/1100 ZWA 43DR
Komb.-Nr. 0 402 438 010
1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Replaces
Firm
Engine MTU MB 8 V 331

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	125,0-145,0	16,0 (24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0 (15,0)	33,0-61,0	
1100		C Sp. 2			
350		C Sp. 5	12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	min⁻¹	Medium rated speed: Control lever deflection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.58	650	18,0		ca.27	150	14,1-16,4	ca.21	150	11,0-14,2	-	-
	1100	17,5-18,0			200	10,4-12,5		220	8,0-8,6		
	1150	11,7-16,0			350	7,4-7,6		250	7,6-7,8		
	1200	3,0-10,0			500	2,0-2,7		400	2,6-4,3		
	1280	0-1,0			650	2,0		520	0		
					1000	1,8-2,0					
					1160	0					

Torque control travel a = - mm Speed regulation: At 1130-1140 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1100	318,0-324,0 (315,0-327,0)	-	350	42,0-48,0	100	17,8-18,2 mm RW (17,5-18,5)
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 19,9 c

1. Edition

En.

PE 6 ZW 150/120 RS 75/11 ROUV 375-1200 ZWA 45 R

Komb.-Nr. 0 402 436 035

Replaces

Firm. MTU

Engine MB 6 V 331

1 - 2 - 3 - 4 - 5 - 6

0 - 45-120-165-240-285° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60(2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	125,0-145,0	16,0(24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0(15,0)	33,0-61,0	
1200		C Sp 2			
375		C Sp 5	12,0		

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.85	1200	17,7-21,4	-	-	-	ca.32	240	18,0-20,0	-	-
	1250	11,5-16,8					340	8,6- 9,7		
	1300	3,5-11,5					375	7,9-8,1		
	1350	0 - 5,6					460	3,5-5,6		
	1400	0 - 2,0					600	1,6-4,3		
		-					820	0		

Torque control travel a = mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1200	279,0-285,0 (276,0-288,0)	-	375	42,0-48,0	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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E15

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 h
1. Edition
En.

PE 8 ZW 150/120 RS 76/11 RQUV 300-775 ZW (A) 47 R

Replaces
Firm MTU
Engine MB 8 V 331

Komb.-Nr. 0 402 438 007

1- 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ±0,5° (±0,75°)

Note VDT-W-400/305
All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testöl ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60(2,45-2,65) mm from BDC Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	125,0-145,0	16,0(24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0(15,0)	33,0-61,0	
775		C Sp 2			
300		C Sp 5	12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.82	800	18,0-21,5		-	-	-	ca.15	280	8,4-10,3	-	-
	900	0						320	6,1-9,3		
ca.73	775	11,6-14,8						400	0,9-4,0		
	800	5,1-11,1						540	0		
	820	0 - 8,0									
	875	0									

Torque control travel a = mm Speed regulation At 780-790 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
775	279,0-285,0 (276,0-288,0)	-	300	50,0-55,0	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 h1
1. Edition
En.

PE 8 ZW 150/120 RS 76/11 RQUV 375-1200 ZWA 45 R

Komb.-Nr. 0 402 438 003

Replaces
Firm
Engine MTU UB 8 V 331

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ±0,5° (±0,75°)

Note VDT-W-400/305
All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60(2,45-2,65)(from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	125,0-145,0	16,0(24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0(15,0)	33,0-61,0	
200		C Sp 2			
375		C Sp 5	12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.85	1200 1250 1300 1350 1400	17,7-21,4 11,5-16,8 3,5-11,5 0 - 5,6 0 - 2,0	-	-	-	ca.32	240 340 375 460 600 820	18,0-20,0 8,6- 9,7 7,9- 8,1 3,5- 5,6 1,6- 4,3 0	-	-

Torque control travel a = mm Speed regulation Δn 1230-1240 min⁻¹ = mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics: min 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
1200	279,0-285,0 (276,0-288,0)	-	375	42,0-48,0	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 19,9 b
5. Edition
En.

PE 6 ZW 150/120 RS 1001/11 RQUV 300-1200 ZWA 48 R

Replaces 1.78
Firm MTU
Engine MB 6 V 331

1 - 2 - 3 - 4 - 5 - 6
0 - 45-120-165-240-285° ± 0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-190 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 6

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed Control lever deflection degrees 1	min 2	Control-rod travel mm 3	min	Medium rated speed Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control min 10	Control-rod travel mm 11
ca. 85	1200	8,0-21,0		ca. 30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8			375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6			500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4			600	0,8-2,1		570	0		
	1420	0 -2,0			730	0					

Torque control travel a = - mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Idle	Fuel-deliver characteristics min 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
1200	18 mm RW	300 = 8,0 mm RW		-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

11.83

Checking values in brackets

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 c
1. Edition
En.

PE 8 ZW150/120 RS 1002/11 RQUV 300-1200 ZWA 48 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Replaces

Firm MTU

Engine MB 8 V 331

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) cyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	8,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever de-flection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.85	1200	8,0-21,0	ca. 30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0 -2,0		730	0					

Torque control travel a = - mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1200	18 mm RW	Idle 300 = 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 19,9 d
1. Edition
En.

PE 6 ZW 150/120 RS 1007/11 RQU 250-350/1100 ZWA 43 DR

Replaces
Firm MTU
Engine MB 6 V 331

1 - 2 - 3 - 4 - 5 - 6
0 - 45-120-165-240-285° ± 0,5° (±0,75°)

Note VDT-W-400/305 Governor adjustement according to VDT-I-420/112

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3 min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 58	650	18,0-18,5	ca. 27	100	14,5-17,5	ca.21	150	9,5-11,8	-	-
	1100	17,5-18,0		350	7,6-8,2		250	7,7-8,2		
	1150	13,7-16,0		650	1,8-2,4		400	2,2-4,5		
	1200	3,0-10,0		1000	1,8-2,4		530	0		
	1230	0 - 1,0		1150	0					

Torque control travel a = - mm Speed regulation: At 1130-1140 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
1100	18 mm RW	300 = 8,0 mm RW	-	-	100	18,0-18,2 mm RW
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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E20

2s

Test specifications Fuel injection pumps and governors

En.

WPP 001/4 MTU 19,9 c1
1. Edition

PE 6 ZW 150/120 RS 1007/11 RQU 250-400/1100 ZWA 49 R

Replaces
Firm MTU
Engine MB 6 V 331

1 - 2 - 3 - 4 - 5 - 6
0 - 45-120-165-240-285° ± 0,5° (±0,75°)

Note VDT-W-400/305 Governor adjustement according to VDT-I-420/112

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3 min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 58	700	18,0-18,5	ca. 22	150	15,0-18,0	ca.13	150	9,8-11,9	-	-
	1125	17,6-18,0		400	7,8-8,8		250	7,8-8,2		
	1150	12,0-17,0		700	1,8-2,4		400	2,3-4,5		
	1200	0 - 7,5		1100	1,8-2,4		530	0		
	1300	0 - 1,0		1160	0					

Torque control travel a = - mm Speed regulation At 1130-1140 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
1100	18 mm RW	300 = 8,0 mm RW	-	-	100	18,0-18,2 mm RW
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

11.83

Checking values in brackets

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 39,7 e
1. Edition
En.

PE 12 ZW 150/120 RS 1008/11 RQUV 300-1200 ZWA 50 R

Replaces

Firm MTU

Engine MB 12 V 331

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345° ± 0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 12

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control mm 10	Control-rod travel mm 11
ca.85	1200	8,0-21,0	ca.30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7.2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0.3-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = - mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Fuel-delivery characteristics min 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
1200	18 mm RW	300 Idle = 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

11.83

Checking values in brackets

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2s

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 39,7 e 1

1. Edition

En.

PE 12 ZW 150/120 RS 1008/11 RQUV 300-1200 ZWA 55 R

Replaces

Firm MTU

Engine MB 12 V 331

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345° ±0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from SDC) Zyl. 12

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed Control lever de-flection degrees 7	min 8	Control-rod travel mm 9	Torque control min 10	Control-rod travel mm 11
ca.85	1200	8,0-21,0	ca.30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = - mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Fuel-delivery characteristics min 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
1200	18 mm RW	300 Idle = 8,0 mm RW	-		-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

11.83

Checking values in brackets

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 e 1
1. Edition
En.

PE 8 ZW 150/120 RS 1009/11 RQU 250-400/1100 ZWA 49 R

Replaces
Firm
Engine MTU MB 8 V 331

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ±0,5° (± 0,75°)

Note VDT-W 400/305!
Governor adjustment according to VDT-I-420/112

Testoil-ISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl.8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0- 90,0	10,0(15,0)	65,0- 95,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.58	700	18,0-18,5		ca.22	150	15,0-18,0	ca.13	150	9,8-11,9	-	-
	1125	17,6-18,0			400	7,8-8,8		250	7,8- 8,2		
	1150	12,0-17,0			700	1,8-2,4		400	2,3-4,5		
	1200	0- 7,5			1100	1,8-2,4		530	0		
	1300	0- 1,0			1160	0					

Torque control travel a = · mm Speed regulation At 1130-1140 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
1100	18 mm RW	300 Idle speed = 8,0 mm RW	-	-	100	18,0-18,2 mm RW
						shutoff solenoid 0,5-1,5 mm before stop

Checking values in brackets

11.83

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2s

Test specifications Fuel injection pumps and governors

En.

WPP 001/4 MTU 26,5 e

1. Edition

PE 8 ZW 150/120 RS 1009/11 RQUV 300-1200 ZWA 50 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Note VDT-W-400/305

Replaces

Firm MTU

Engine MB 8 V 331

Test oil 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Control lever deflection degrees 4	min 5	Control-rod travel mm 6	Control lever deflection degrees 7	min 8	Control-rod travel mm 9	min 10	Control-rod travel mm 11
ca.85	1200	8,0-21,0	ca.30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = - mm Speed regulation At 1130-1140 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm³/1000 strokes 2	min 3 Idle	min 4	cm³/1000 strokes 5	min 6	cm³/1000 strokes 7
1200	18 mm RW	300 = 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 39,7 b 1

2. Edition

En.

PE 12 ZW 150/120 RS 1010/11 RQUV 300-1200 ZWA 51 R
Komb.-Nr. 0 402 430 004
1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345° ± 0,5° (± 0,75°)

Replaces 5.83
Firm MTU
Engine 12 V 331

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testöl-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,5 - 2,6 (2,45-2,65) mm (from BDC) Zyl. 12

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-95,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed: Control lever deflection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca.85	1200	18,0-21,0	ca.30	375	6,0-7,2	ca.23	300	7,3-8,6	-	-
	1250	12,2-16,8		250	12,2-14,6		150	14,3-16,1		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = - mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
1200	18 mm RW	Idle 300 = 8,0 mm RW	-	-	-	-

11.83

Checking values in brackets

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F2

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 23,8 a
5. Edition
En.
Replaces 1.78

PE 6 ZW 160/120 RS 1012/11 RQUV 300-900 ZWA 51 R

Firm MTU
Engine MT 6 V 396

1 - 2 - 3 - 4 - 5 - 6
0 -45 -120-165-240-285° ± 0,5° (±0,75°)

Note VDT-W-400/305

Testoil-ISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-26,0 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 85	920 950 1020 1090	18,0-21,5 14,4-18,6 4,0-10,2 0-2,0	ca. 30	200 300 375 500 630	13,0-15,0 10,0-11,5 8,0 2,5-4,2 0	ca.23	100 300 450 570	14,2-16,0 8,0 1,6-3,7 0	-	-

Torque control travel a = - mm Speed regulation At 910-915 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min 1	cm³/1000 strokes 2	Control rod stop at speed: min 3	Fuel-delivery characteristic: min 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
900	18 mm RW	300 = 8 mm Rw	-	-	-	-

Checking values in brackets

11.83

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F3

Test specifications Fuel injection pumps and governors

En.

WPP 001/4 MTU 23,8 b

1. Edition

Replaces

Firm MTU

Engine MT 6 V 396

PE 6 ZW 160/120 RS 1012/11   RQUV 750 ZWA 53 R

1 - 2 - 3 - 4 - 5 - 6

0 -45 -120-165-240-285° ± 0,5° (± 0,75°)

Note VDT-W-400/305

Testöl ISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever deflection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: mm 10	Control-rod travel mm 11
ca. 69	750	18,0	-	-	-	-	-	-	-	-
	770	9,6-11,8								
	790	1,4-5,2								
	810	0								

Torque control travel a = - mm   Speed regulation: At 760-765 min⁻¹ min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
750	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

11.83

F4

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F4

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 23,8 c
1. Edition
En.

PE 6 ZW 160/120 RS 1012/11 RQUV 900 ZWA 53 R

Replaces
Firm MTU
Engine MT 6 V 396

1 - 2 - 3 - 4 - 5 - 6
0 -45 -120-165-240-285° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Test oil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 70	900	18,0	-	-	-	-	-	-	-	-
	920	11,1-12,0								
	940	1,4-5,6								
	965	0								

Torque control travel a = mm Speed regulation At 910-915 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min 1	cm³/1000 strokes 2	Control rod stop at speed: idle stop min 3	Fuel-delivery charactenstics: min 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
900	18 mm RW	12 mm RW	-	-	-	-

11.83

Checking values in brackets

F5

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2s

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 23,8 f

1. Edition

En.

PE 6 ZW 160/120 RS 1012/11 RQU 750 ZWA 56 R

1 -2- 3- 4- 5- 6
0-45-120-165-240-285° -+ 0,5° (± 0,75°)

Note VDT-W-400/305

Replaces

Firm MTU

Engine MT 6 V 396

TestoilISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a - - mm Speed regulation At 760-765 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
750	18 mm RW	12 mm RW	-	-	100 with	ca. 20 mm RW starting magnet

11.83

Checking values in brackets

F6

BOSCH

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F6

2s

Test specifications Fuel injection pumps and governors

En.

WPP 001/4 MTU 23,8 d
1. Edition

Replaces

Firm MTU
Engine MT 6 V 396

PE 6 ZW 160/120 RS 1012/11 RQU 900 ZWA 56 R

1 - 2 - 3 - 4 - 5 - 6
0 -45 -120-165-240-285° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Test oil ISO 4113

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3 min	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 52	900	18,0	-	-	-	-	-	-	-	-
	860	26,8-32,4								
	880	22,3-26,3								
	900	17,0-19,0								
	930	3,7-10,0								
	960	0								

Torque control travel a = mm Speed regulation At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min 1	cm³/1000 strokes 2	Control rod stop at speed: idle stop min 3	Fuel-delivery characteristics: min 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
900	18 mm RW	12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

11.83

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F7

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 23,8 e
1. Edition
En.

PE 6 ZW 160/120 RS 1012/11 RQU 750 ZWA 57 R

Replaces
Firm MTU
Engine MT 6 V 396

1- 2- 3- 4- 5- 6
0-45-120-165-240-285° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 6

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm Speed regulation At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min 1	cm³/1000 strokes 2	Control rod stop at speed: min 3	Fuel-delivery characteristics: min 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
750	18 mm RW	idle stop 12 mm RW	-	-	-	-

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 31,7 a

1. Edition

En.

PE 8 ZW 160/ 120 RS 1013/11 RQUV 300-900 ZWA 51 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^0 \pm 0{,}5^0$ ($\pm 0{,}75^0$)

Note VDT-W-400/305 !

Replaces

Firm MTU

Engine: MT 8 V 396

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Test-No. 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 85	920 950 1020 1090	18,0-21,5 14,4-18,6 4,0-10,2 0 - 2,0	ca. 30	200 300 375 500 630	13,0-15,0 10,0-11,5 8,0 2,5-4,2 0	ca.23	100 300 450 570	14,2-16,0 8,0 1,6-3,7 0	-	-

Torque control travel a = - mm Speed regulation: At 910-915 min^{-1} mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Fuel-delivery characteristics min 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
900	18 mm RW	300 Idle = 8 mm RW	-	-	-	-

Checking values in brackets

11.83

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F9

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 31,7 b
1. Edition
En.

PE 8 ZW 160/ 120 RS 1013/11 RQUV 750 ZWA 53 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Replaces

Firm MTU

Engine MT 8 V 396

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-CD 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 69	750	18,0	-	-	-	-	-	-	-	-
	770	9,6-11,8								
	790	1,4-5,2								
	810	0								

Torque control travel a - mm Speed regulation. At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
750	18 mm RW	idle stop 12 mm RW	-	-	-	-

Checking values in brackets

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2s

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 31,7 c
1. Edition
En.

PE 8 ZW 160/120 RS 1013/11 RQUV 900 ZWA 53 R

Replaces
Firm MTU
Engine MT 8 V 396

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 70	900	18,0	-	-	-	-	-	-	-	-
	920 940 965	11,1-12,0 1,4-5,6 0								

Torque control travel a - mm

Speed regulation: At 910-915 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
900	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 31,7 f
16. Edition
En.

PE 8 ZW 160/120 RS 1013/11 RQU 750 ZWA 56 R

Replaces

Firm MTU

Engine MT 8 V 396

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^{0} \pm 0{,}5^{0}$ ($\pm 0{,}75^{0}$)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3 min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: mm 10	Control-rod travel mm 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm Speed regulation: At 760-765 min^{-1} mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
750	18 mm RW	12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 31,7 d
1. Edition
En.

PE 8 ZW 160/120 RS 1013/11 RQU 900 ZWA 56 R

Replaces
Firm MTU
Engine MT 8 V 396

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testgrad 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDZyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	Upper rated speed: mm min⁻¹ 2	Upper rated speed: Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever deflection degrees 4	Medium rated speed: min⁻¹ 5	Medium rated speed: Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	Lower rated speed: min⁻¹ 8	Lower rated speed: Control-rod travel mm 9	Torque control: min⁻¹ 10	Torque control: Control-rod travel mm 11
ca. 52	900	18,0	-	-	-	-	-	-	-	-
	860	26,8-32,4								
	880	22,3-26,3								
	900	17,0-19,0								
	930	3,7-10,0								
	960	0								

Torque control travel a = - mm Speed regulation At 910-915 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	Full-load delivery on governor control lever (Test oil temperature 40°): cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	Fuel-delivery characteristics: cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	Starting fuel delivery: cm³/1000 strokes 7
900	18 mm RW	12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

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F13

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 31,7 e

1. Edition

En.

PE 8 ZW 160/120 RS 1013/11 RQU 750 ZWA 57 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Replaces

Firm MTU

Engine MT 8 V 396

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-150 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	Upper rated speed: mm min⁻¹ 2	Upper rated speed: Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever deflection degrees 4	Medium rated speed: min⁻¹ 5	Medium rated speed: Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	Lower rated speed: min⁻¹ 8	Lower rated speed: Control-rod travel mm 9	Torque control: min⁻¹ 10	Torque control: Control-rod travel mm 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm Speed regulation At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: idle stop min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
750	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

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EA4

2s

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 47,5 d

1. Edition

En.

Regulator: MTU

PE 12 ZW 160/120 RS 1015/11 RQUV 300-900 ZWA 51 R

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345° ±0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment.

Test oil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 12

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 85	920	18,0-21,5	ca. 30	200	13,0-15,0	ca. 23	100	14,2-16,0	-	-
	950	14,4-18,6		300	10,0-11,5		300	8,0		
	1020	4,0-10,2		375	8,0		450	1,6-3,7		
	1090	0-2,0		500	2,5-4,2		570	0		
				630	0					

Torque control travel a = - mm

Speed regulation: At 910-915 min^{-1} 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
900	18 mm RW	Idle 300 = 8 mm RW	-	-	-	-

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 47,5 e

1. Edition

En.

Replaces

PE 12 ZW 160/120 RS 1015/11 RQUV 750 ZWA 53 R

Firm MTU
Engine MT 12 V 396

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345° ±0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 12

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3 min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 69	750	18,0	-	-	-	-	-	-	-	-
	770	9,6-11,8								
	790	1,4- 5,2								
	810	0								

Torque control travel a = - - mm

Speed regulation: At 760-765 min⁻¹ min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
750	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

11.83

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2s

Test specifications Fuel injection pumps and governors

40

WPP 001/4 MTU 47,5 c

2. Edition

En.

PE 12 ZW 160/120 RS 1015/11 RQU 750 ZWA 57 R

Replaces 5.83

Firm: MTU

Engine: MT 12 V 396

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345° ±0,5° (±0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 12

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3 min⁻¹	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm Speed regulation: At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
750	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

11.83

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F17

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 d

1. Edition

En.

Replaces

PE 8 ZW 150/120 RS 1019/11 RQUV 300-1200 ZWA 51 R

Firm

Engine MTU MB 8 V 331

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever deflection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca.85	1200	8,0-21,0	ca.30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = - mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min 1	cm³/1000 strokes 2	Control rod stop at speed: min 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
1200	18 mm RW	300 Idle = 8,0 mm RW	-	-	-	-

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 19,9 b1
1. Edition
En.

PE 6 ZW 150/120 RS 1021/11 RQUV 300-1200 ZWA 51 R

Replaces
Firm MTU
Engine MB 6 V 331

1 - 2 - 3 - 4 - 5 - 6
0 - 45-120-165-240-285° ± 0,5° (±0,75°)

Note VDT-W-400/305
All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Test oil ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) Cyl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 85	1200	8,0-21,0	ca. 30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0 -2,0		730	0					

Torque control travel a = mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1200	18 mm RW	300 Idle = 8,0 mm RW	-	-	-	-

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 26,5 b
2. Edition
En.

PE 8 ZW 160/120 RS 1027/11 RQUV 300-1200 ZWA 51 R
Komb.-Nr. 0 402 438 024
1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^{o} \pm 0{,}5^{o}(\pm 0{,}75^{o})$

Replaces 5.83
Firm MTU
Engine 331

Note VDT-W-400/305

Testoil-ISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,5 - 2,6 (2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed: Control lever deflection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 84	1200	18,0-19,0	ca. 27	375	8,0	ca. 21	300	8,0	-	-
	17,0	1205-1225		200	14,3-17,2		200	10,8-14,2		
	4,0	1320-1380		300	10,3-11,8		400	3,9-5,0		
	1400	0 - 2,0		500	2,5-3,7		590	0		
				720	0					

Torque control travel a = mm Speed regulation: At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min 1	cm³/1000 strokes 2	Control rod stop at speed: min 3	Fuel-delivery characteristics: min 4	cm³/1000 strokes 5	Starting fuel delivery: min 6	cm³/1000 strokes 7
Not known The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.		300 → RW 8,0 mm				

11.83

Checking values in brackets

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F20

2s

Test specifications Fuel injection pumps and governors

40

WPP 001/4 MTU 39,7 c

2. Edition

En.

PE 12 ZW 160/120 RS 1029/11 RQUV 300-1200 ZWA 51 R
Komb.-Nr. 0 402 430 009
1 - 12- 9 - 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6

Replaces
Firm 5.83 MTU
Engine 331

0 - 45- 60-105-120-165-180-225-240-285-300-345° ± 0,5° (± 0,75°)

Note VDT-W-400/305 !

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,5 - 2,6 (2,45-2,65) mm (from BDC) Zyl. 12

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	22,0(33,0)	510,0-526,0	
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed Control lever deflection degrees 1	min⁻¹ min 2	Control-rod travel mm 3	Medium rated speed Control lever deflection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control min 10	Control-rod travel mm 11
ca. 84	1200	18,0-19,0	ca. 27	375	8,0	ca. 21	300	8,0	-	-
	17,0	1205-1225		200	14,3-17,2		200	10,8-14,2		
	4.0	1320-1380		300	10,3-11,8		400	3,9-5,0		
	1400	0 - 2,0		500	2,5-3,7		590	0		
				720	0					

Torque control travel a = - mm Speed regulation: At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed idle stop min⁻¹ 3	Fuel-delivery characteristics mm 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
Not known The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.		300 = RW 8,0 mm				

Checking values in brackets

11.83

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F21

Test specifications Fuel injection pumps and governors

WPP 001/4 DAI 22,4 b
En. 6. Edition

PE 6 ZWM 140/120 RS RQU 425/1100 ZW 18 D
RQU 425/1100 ZW 23 D

Replaces
Firm 2.66
Engine Daimler-Benz MB 833 Ba

1- 2- 3 - 4 - 5 - 6
0-45-120-165-240-285 · 0,5° (· 0,75°) Note VDT-W 400/305!

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC) Cyl. 6;

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18	373,0-378,0	11,0(16,0)	369,0-382,0	
600	9	143,0-163,0	14,0(21,0)	148,0-168,0	
200	9	71,0- 91,0	14,0(21,0)	66,0- 95,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

Testoil-ISO 4113

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever deflection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca.60	550	23,5-24,0	Sliding-block position			ca.22	600	2,8-3,2	500	21,8-22,4
ca.58	1100	19,9-20,2					425	6,1-6,5	800	20,8-21,4
	1150	14,6-18,2					200	13,2-14,0	1000	20,2-20,5
	1200	9,0-14,3					350	9,4-11,0	1100	19,9-20,2
	1250	2,6-10,0					800	2,3- 2,8	1130	max.1mm
	1350	0 - 1,0					1100	1,6- 2,0		less
							1180	0		

Torque control travel a = 0,4 · mm +0,05 Speed regulation At 1130 min⁻¹ 1mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1080	342,0-346,0	0,5-1,5 mm before stop	900	331,0-339,0	100	18,0-18,2 mm RW
			700	318,0-326,0		
			550	301,0-309,0	1220	RW max. 5 mm

Checking values in brackets

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F22

2s

Test specifications Fuel injection pumps and governors

En.

WPP U01/4 MTU 29,9 c

9. Edition

Replaces 2.74

Firm MTU

Engine MB 837 Ba (660 PS)

PE 8 ZWM 140/120 RS 19/11 RQUV 300-1100 ZWA 40 R
Komb.-Nr. 0 406 038 018

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	373,0-378,0	11,0 (16,0)	370,0-381,0	-
600	9,0	143,0-163,0	14,0 (21,0)	138,0-168,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1100		C Sp 2	9,0 (13,0)	C Sp 2	
300			8,0 (12,0)		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever deflection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
max. 9	1100	15,0-18,2	-	-	-	26	300	6,8-7,5	-	-
	1150	10,4-14,8					120	12,0-14,0		
	1200	4,8-10,8					250	8,0-10,2		
	1250	0-6,8					400	2,8-4,3		
	1330	0					500	0,9-2,9		
							700	0		

Torque control travel a = - mm Speed regulation At 1130-1145 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	mm RW 7
1100	323,0-327,0 (320,0-330,0)	-	500	238,0-250,0 (235,0-253,0)	100	18,0-18,2 mm RW
			300	64,0-69,0	200	RW max. 5 mm

Checking values in brackets

11.83

BOSCH

F23

Test specifications Fuel injection pumps and governors

En.

WPP 001/4 MTU 22,4 c
4. Edition

PE 6 ZWM 140/120 RS 38/11 RQU 425/1100 ZWA 37 DR
Komb.-Nr. 0 406 036 026
1 - 2 - 3 - 4 - 5 - 6
0 -45 -120-165-240-285° ± 0,5° (± 0,75°)

Replaces 2.83
Firm MTU
Engine 12 V 833 Ea 500

Governor adjustement according to VDT-I-420/112 Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Test-oil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC) 7yl. 6

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	373,0-378,0	11,0 (16,0)	370,0-381,0	-
600	9,0	143,0-163,0	14,0 (21,0)	138,0-166,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1080		C, Sp. 2	9,0 (14,0)		
350		C. Sp. 5	11,0 (16,0)		
425			12,0		

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
max.	600	18,0-18,5	(Position of slider)			ca. 27	600	1,4-1,8	-	-
ca. 58	1100	17,6-18,0					200	17,0-18,0		
	1150	13,6-16,2					350	10,0-14,0		
	1200	9,0-12,4					425	6,0-6,4		
	1250	3,6-8,5					500	2,6-4,2		
	1350	0 - 1,0					1100	1,4-1,8		
							1160	0		

Torque control travel a = -- mm Speed regulation: At 1130 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed min 3	Fuel-delivery characteristics min 4	idle stop cm³/1000 strokes 5	Starting fuel delivery min 6	mm RW xxxxxxxxxx strokes 7
1080	352,0-356,0 (349,0-359,0)	-	550	277,0-295,0 (273,0-299,0)	100	18,0-18,2 mm RW
		Shutoff solenoid 0,5 - 1,5 mm in front of stop	425	Idle 57,0-63,0	High idle 1220	speed RW max. 5 mm

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 29,9 d

2. Edition

En.

PE 8 ZWM 140/120 RS 1018/11 RQU 350-500/1050 ZWA 59 DR
Komb.-Nr. 0 406 038 021
Governor adjustement according to VDT-I-420/112
1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45 ± 0,5 (± 0,75)

Replaces 2.83
Firm MTU
Engine MB 837 Ea
537 kW (730 PS)

Note VDT-W-400/305

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	373,0-378,0	11,0 (16,0)	369,0-382,0	-
600	9,0	143,0-163,0	14,0 (21,0)	148,0-168,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1050		C, Sp. 2	10,0 (15,0)		
300		C, Sp. 5	9,0		

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 62	700	18,0	ca. 43	500	6,6-9,1	ca. 27	300	7,1-8,3	-	-
	1070	17,6-18,0		400	12,0-17,0		100	15,3-18,0		
	1150	9,6-14,0		570	0-4,0		200	12,0-15,7		
	1230	0,4-7,0		660	0		400	1,5-5,2		
	1300	0					520	0		

Torque control travel a = - mm Speed regulation At 1075-1085 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Leerlauf min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min⁻¹ 6	cm³/1000 strokes 7
1050	358,0-362,0 (355,0-365,0)	-	300	80,0-90,0	100	18,0-18,2 mm RW
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

11.83

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G1

2s

Test specifications Fuel injection pumps and governors

40

WPP 001/4 MTU 26,5 a
2. Edition

En.

PE8ZWM 160/120 RS 1032/11 RQUV300-1200 ZWA 51 R
1-2-6-3-4-5-7-8 je 45° ± 0,5° (± 0,75°)
Komb.-Nr. 0 406 038 022
Note VDT-W 400/305!

Replaces
Firm 2.83 MTU
Engine 8 V 331 Hydrofoil

Testoil-ISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC) Cyl.8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0- 92,0	11,0(16,0)	67,0- 97,0	

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca.84	1200	18,0-19,0	ca.27	375	8,0	ca.21	300	8,0	-	-
ca.84	17,0	1205-1225		200	14,3-17,2		200	10,8-14,2		
	4,0	1320-1380		300	10,3-11,8		400	3,9- 5,0		
	1400	0 - 2,0		500	2,5- 3,7		590	0		
				720	0					

Torque control travel a = · mm Speed regulation At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.		300 = RW 8,0 mm				

Checking values in brackets

11.83

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G2 -22

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 29,9 f

1. Edition

En.

Replaces -

PE 8 ZWM 150/120 RS 1035 RQU 300-500/1100 ZWA 59 DR
Komb.-Nr. 0 406 038 024
1-2-6-3-4-5-7-8 je 45° ± 0,5 ° (± 0,75°)
Governor adjustement according to VDT-I-420/112

Firm MTU
Engine UB 837 EA - Italien

Note VDT-W-400/305
All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	527,0-537,0	14,0 (21,0)	524,0-540,0	
1000	9,0	175,0-195,0	12,0 (18,0)	170,0-200,0	
300	9,0	104,0-124,0	16,0-(24,0)	99,0-129,0	
1100	12,3	Abschn. C	12,0 (18,0)		
800	13,2		16,0 (24,0)		
425	6,7		12,0		

Testoil-ISO 4113

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min 10	Control-rod travel mm 11
ca. 65	800	18,0-18,5	ca.-39	500	7,0	ca. 33	425	6,6-6,9	1100	12,3
	1100	12,3					300	13,0-15,0	800	13,1+0,2
	11,3	1125-1140	ca. 19	300	7,0		400	7,8-9,0		
	5,0	1189-1215					500	1,0-3,3		
	0	1255-1275					535	0 - 0,5		

Torque control travel a = 0,2 mm+ 0,5 Speed regulation At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed: min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
1100	302,0-308,0 (300,0-310,0)	700 (Lasche)	800	331,0-351,0 (326,0-356,0)	425	53,0-59,0

Checking values in brackets

11.83

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Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 44,3 a
3. Edition
En.

PE 8 ZWM 160/120 RS 2001 RQUV 300-1050 ZWA 65 R

Komb.-Nr. 0 406 038 023

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je 45° ± 0,5° (± 0,75°)

Note VDT-W-400/305 !

Replaces 5.83
Firm MTU
Engine 396-03
960 kW

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,5 - 2,6 (2,45-2,65) mm (from BDC) Zyl. 8

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	622,0-636,0	20,0 (30,0)	619,0 - 639,0	-
1000	9,0	220,0-248,0	28,0 (42,0)	215,0 - 253,0	
300	9,0	104,0-128,0	16,0 (24,0)	99,0 - 133,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed Control lever deflection degrees 1	mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed Control lever flection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control min 10	Control-rod travel mm 11
ca. 82	1050	18,0	ca. 27	375	8,0	ca.21	300	8,0	-	-
	17,0	1055-1075		200	14,3-17,2		200	10,8-14,2		
	4,0	1150-1210		300	10,3-11,8		400	3,9-5,0		
	1250	0-2,0		500	1,9-3,7		590	0		
				720	0					

Torque control travel a = - mm Speed regulation At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°) min 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics min 4	cm³/1000 strokes 5	Starting fuel delivery min 6	cm³/1000 strokes 7
		idle stop 300 = RW 8,0 mm	-	-	-	-

Not known
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.

Checking values in brackets

11.83

BOSCH Geschäftsbereich KH Kundendienst Kfz Ausrüstung
by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

Test specifications Fuel injection pumps and governors

WPP 001/4 MTU 47,5 a
4. Edition
En.

PE 12 ZWM 160/120 RS 2002 RQUV 300-1050 ZWA 65 R

Replaces
Firm 4.83 MTU
Engine 12 V 396-03
1440 kW

1- 2- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345 ° ±0,5°(±0,75°)

Note VDT-W-400/305 !

Kcmb.-Nr. 0 406 030 002

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from adjl. Zyl. 12

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	622,0-636,0	20,0 (30,0)	619,0-639,0	
1000	9,0	220,0-248,0	28,0 (42,0)	215,0-253,0	
300	9,0	104,0-128,0	16,0 (24,0)	99,0-133,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	min⁻¹ min 2	Control-rod travel mm min 3	Medium rated speed: Control lever flection degrees 4	min 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 82	1050	18,0	ca. 27	375	8,0	ca. 21	300	8,0	-	-
	17,0	1055-1075		200	14,3-17,2		200	10,8-14,2		
	4,0	1150-1210		300	10,3-11,8		400	3,9-5,0		
	1250	0 - 2,0		500	1,9-3,7		590	0		
				720	0					

Torque control travel a = - mm Speed regulation At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40): min 1	cm³/1000 strokes 2	Control rod stop at speed: idle stop min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
Not known The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.		300 = RW 8,0 mm				

Checking values in brackets

11.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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Test specifications Fuel injection pumps and governors

PE 6 ZWM 160/120 RS 2004 RQUV 300-1050 ZWA 65 R

Komb.-Nr. 0 406 036 034

1- 2- 3 - 4 - 5 - 6

0-45-120-165-240-325 ° ± 0,50 (± 0,75 °)

Note VDT-W-400/305 !

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Replaces

Firm 4.83 MTU

Engine 396-03

720 kW

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed min⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm³/1000 strokes 3	Difference in fuel delivery cm³/1000 strokes 4	Fuel delivery Checking values cm³/1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	622,0-636,0	20,0 (30,0)	619,0-639,0	
1000	9,0	220,0-248,0	28,0 (42,0)	215,0-253,0	
300	9,0	104,0-128,0	16,0 (24,0)	99,0-133,0	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor settings

Upper rated speed: Control lever deflection degrees 1	Control-rod travel mm min⁻¹ 2	Control-rod travel mm min⁻¹ 3	Medium rated speed: Control lever deflection degrees 4	min⁻¹ 5	Control-rod travel mm 6	Lower rated speed: Control lever deflection degrees 7	min⁻¹ 8	Control-rod travel mm 9	Torque control: min⁻¹ 10	Control-rod travel mm 11
ca. 82	1050	18,0	ca. 27	375	8,0	ca. 21	300	8,0	-	-
	17,0	1055-1075		200	14,3-17,2		200	10,8-14,2		
	4,0	1150-1210		300	10,3-11,8		400	3,9-5,0		
	1250	0 - 2,0		500	1,9-3,7		590	0		
				720	0					

Torque control travel a = - mm Speed regulation At 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°): min⁻¹ 1	cm³/1000 strokes 2	Control rod stop at speed min⁻¹ 3	Fuel-delivery characteristics: min⁻¹ 4	cm³/1000 strokes 5	Starting fuel delivery: min⁻¹ 6	cm³/1000 strokes 7
		idle stop 300 = RW 8,0 mm				

Not known
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.

Checking values in brackets

11.83

BOSCH Geschäftsbereich KN Kundendienst, Kfz-Ausrüstung
by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
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Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 BMW 2,4 a
1. Edition
En

Testoil-ISO 4113

VE 6/10 F 2400 R 121
0 460 406 022
DHK: 1 688 901 022 / 130 bar

Test pressure line
6x2x450 mm / 1 680 750 073;
Overflow temperature 45° C

supersedes -
company BMW
engine M 21 D 24-Europa

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings

	Rot speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1 1 Timing device travel	1500	4,3-4,7	mm	1,050	
1 2 Supply pump pressure	1500	6,1-6,5	bar (kgf/cm²)	1,050	
1 3 Full-load delivery without charge-air pressure	500	28,0-29,0	cm³/1000 strokes	0	3,0
Full-load delivery with charge-air pressure	1500	40,8-41,8	cm³/1000 strokes	1,050	2,5
1 4 Idle speed regulation	400	6,0-10,0	cm³/1000 strokes	0	3,0
1 5 Start	250	35,0-36,0	cm³/1000 strokes	0	
1 6 Full-load speed regulation	2600	17,5-23,5	cm³/1000 strokes	1,050	
1 7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=1,050	n = rev/min	500	750	1000	1500	2300
	mm	(*)	1,1-1,9(0,8-2,2)	(*)	(3,8-5,2)	7,4-8,2(7,1-8,5)
2.2 Supply pump LDA=1,050	n = rev/min	500				2300
	bar (kgf/cm²)	3,2-3,6				8,1-8,5
Overflow delivery	n = rev/min	500				2400
	cm³/10 s	55-138(40-153)				55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2700	7,0-13,0	(6,0-14,0)	1,050
	2600		(16,5-24,5)	1,050
	2400	40,6-42,6	(39,4-43,8)	1,050
	1500		(39,1-43,5)	1,050
	** 750	34,5-35,5	(32,0-38,0)	0,250
	500		(25,5-31,5)	0
switch-off	2400	0		
Idle stop	400		(4,0-12,0)	
	475	max. 3,0		
End stop	100	26,5-36,5		
	400	31,5-41,5		
	480	25,2-29,8		

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,5-1,7
SVS	4,0
A	
B	

2.4 Solenoid

max. cut-in voltage xxx min. 10 V
test voltage xxxxxxxxx rated voltage 12V.

Observations
*Test hydr. cold-start accelerator:
Please note instructions on sheet 2.
**Correction at the adjusting nut (46).

10.83

G7

G7

* Test hydr. cold-start accelerator:

Apply 12 V to magnet of hydr. cold-start accelerator.
500 1/min 1.9 - 2.9 (1.7-3.1)
1000 1/min 3.7 - 4.7 (3.5-4.9)

** Manifold-pressure compensator stroke = 4.3 mm

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 HAN 3,1 e 2

2. Edition

En

Testoil-ISO 4113

VA 6/100 H 1300 BR 54-3

0 460 306 100

supersedes 6.82

company Hanomag

engine D 162 R-92 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment
VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,3 mm
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	900	3,0-4,0	mm		
1 2 Supply pump pressure	900	4,7-5,2	kp/cm²		
1 3 Full-load delivery without charge-air pressure	1100	57,0-58,0	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1 4 Idle speed regulation	300	12,0-18,0	cm³/1000 strokes		3,0
1 5 Start (mech.)	100	mind.65,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1430	38,5-46,5	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	580-730 (550-760)	900	1000-1150
	mm	Beginn	(2,7-4,3)	4,7-5,4 (4,4-5,7)
2 2 Supply pump	rev/min	100	900	1300
	kp/cm²	1,1-1,6 (0,9-1,8)	(4,5-5,4)	5,9-6,4 (5,7-6,6)
Overflow delivery	rev/min	500	1000	
	cm³/10 s	mind. 25	55-125 (40-140)	

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1480-1530	0		
		(1460-1550)			
		1430		(37,5-47,5)	
		1300	58,0-61,0	(57,0-62,0)	
		1100		(56,5-58,5)	
		500	50,0-53,0	(49,0-54,0)	
	Stop	1300	0		
Idle stop	Full	450-570	0		
		(430-590)			
		300		(11,0-19,0)	
	Start	100	mind. 65,0		
End stop		mind. 150			

1.84

Angle to the stop plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 40 ± 8° γ = 30 - 8° δ = 60 ± 8°	Pump Dimension IV = 6,0 mm (s.a.BMP 161/32) Dimension V = - mm

G10

G10

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 IHC 4,4 d 1 **46**

2. Edition

En

Testoil-ISO 4113

A 4/11 H 1250 CR 93-2

0 460 314 045

supersedes 6.82

company IHC

engine D 268/510

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Instructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,5 mm
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	1000	6,1-6,7	mm		
1 2 Supply pump pressure	1000	5,5-6,0	kp/cm²		
1 3 Full-load delivery without charge-air pressure	800	80,5-81,5	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1 4 Idle speed regulation	400	12,0-18,0	cm³/1000 strokes		3,0
1 5 Start	100	mind. 95,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1330	34,0-42,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	500	1000	1250
	mm	0,5-1,5 (0,3-1,7)	(5,9-6,9)	7,0-7,7 (6,8-7,9)
2 2 Supply pump	rev/min	200	1000	1250
	kp/cm²	1,5-2,0 (1,3-2,2)	(5,3-6,2)	6,2-6,7 (6,0-6,9)
Overflow delivery	rev/min	500		1250
	cm³/10 s	55-100 (40-110)		55-100 (40-110)

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1400-1450	0		
		1330		(33,0-43,0)	
		1200	84,5-87,5	(83,5-88,5)	
		800		(80,0-82,0)	
		500	78,0-82,0	(77,0-83,0)	
	Stop	1250	0		
Idle stop	Full	470-520	0		
		400		(11,0-19,0)	
End stop	Start	100	mind. 95,0		

1.84

Angle to the stop-plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 36 ± 8° γ = 30 - 8° δ = 60 ± 8°	Pump Dimension IV = - mm Dimension V = - mm

G12

G12

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 FIA 2,6 c

4. Edition

En

Testoil-ISO 4113

VA 3/11 H 1200 CL 134-9
0 460 313 019

supersedes 6.82
company Fiat
engine 8035-04265

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,7 mm ±0,02 (±0,04)
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	800	4,1-5,1	mm		
1 2 Supply pump pressure	800	4,8-5,3	kp/cm²		
1 3 Full-load delivery without charge-air pressure	800	68,0-69,0	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1 4 Idle speed regulation	300	17,0-23,0	cm³/1000 strokes		3,0
1 5 Start	100	mind.120,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1300	36,0-44,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	Beginn	600	800	1050	1100-1230
	mm	330-430	1,8-2,8(1,6-3,0)	(3,9-5,3)	6,9-7,9(6,7.7,1)	9,0-9,6 (8,8-9,3)
2 2 Supply pump	rev/min	200		800		1200
	kp/cm²	1,7-2,1(1,5-2,3)		(4,6-5,5)		6,6-7,1(6,4-7,3)
Overflow delivery	rev/min	500				1200
	cm³/10 s	55-100(40-110)				55-100(40-110)

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes	Charge-air pressure kp/cm²
End stop	Full	1360-1410	0	
		1300		(35,0-45,0)
		1250-1270	Beginn	
		1200	61,0-64,0	(60,0-65,0)
		800		(67,5-69,5)
		500	62,5-66,5	(61,5-67,5)
	Stop	1200	0	
Idle stop	Full	340-400	0	
		300		(16,0-24,0)
	Start	100	mind.120,0	
End stop		110-230		

G13

G13

Angle to the stop-plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 45 ± 3° γ = 30 - 8° δ = 60 + 8°	Pump Dimension IV = 3,80 mm Dimension V = 24,65 mm

G14

Test Specifications Distributor-Type Fuel Injection Pump

46

WPP 001/4 FIA 3,5c
3. Edition

En

Testoil-ISO 4113

VA 4/110 H 1250 CL 136-8
0 460 314 038

supersedes 6.82
company Fiat
engine 8045-02270
66 PS

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B

Pre-stroke setting 0,5 mm ± 0,02 (± 0,04)
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

Pre-setting see reverse side

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	1000	5,3-6,3	mm		
1 2 Supply pump pressure	1000	5,3-5,8	kp/cm²		
1 3 Full-load delivery without charge-air pressure	800	67,5-68,5	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1 4 Idle speed regulation	300	22,0-28,0	cm³/1000 strokes		3,0
1 5 Start	100	mind. 110,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1400	26,0-34,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	700	1000	1250
	mm	2,4-3,2 (2,1-3,5)	(5,1-6,5)	6,0-6,7 (5,6-7,0)
2 2 Supply pump	rev/min	200	1000	1250
	kp/cm²	1,5-2,0 (1,3-1,8)	(5,1-6,0)	6,2-6,7 (6,0-6,9)
Overflow delivery	rev/min	500		1250
	cm³/10 s	55-100 (40-110)		55-100 (40-110)

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1450-1500	0		
		1400		(25,0-35,0)	
		1250	65,5-68,5	(64,5-69,5)	
		800		(66,5-69,5)	
		500	59,0-62,0	(58,0-63,0)	
	Stop	1250	0		
Idle stop	Full	400-450	0		
		300		(21,0-29,0)	
		100	mind. 110,0		
	Start				
End stop		110-230			

1.84

G15

Angle to the stop-plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 35 ± 8° γ = 30 - 8° δ = 60 + 8°	Pump Dimension IV = 3,00 mm Dimension V = 24,65 mm

G1n

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 FIA 5,5 n

1. Edition

En

Testoil ISO 4113

VA 6/11 H 1200 CR 185-4

0 460 316 042

supersedes -

company Fiat

engine 8065-02

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel injection Pump Test Benches and Testers
Test intructions and Test Equipment VDT WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0.5 mm
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1.1 Timing device travel	900	5,9-6,7	mm		
1.2 Supply pump pressure	900	5,0-5,5	kp/cm²		
1.3 Full-load delivery without charge-air pressure	900	68,0-69,0	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	350	12,0-18,0	cm³/1000 strokes		3,0
1.5 Start	100	min.90,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1300	22,0-30,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min	500	900	
	mm	1,5-2,3(1,2-2,6)	(5,6-7,0)	
2.2 Supply pump	rev/min	200	900	1200
	kp/cm²	1,4-1,9(1,2-2,1)	(4,8-5,7)	6,2-6,7(6,0-6,9)
Overflow delivery	rev/min	500		1200
	cm³/10 s	55-100(40-110)		55-100(40-110)

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge air pressure kp/cm²
End stop	Full	1330-1380	0		
		1300		(21,0-31,0)	
		1180	60,5-63,5	(59,5-64,5)	
		900		(67,5-69,5)	
		500	53,0-56,0	(52,0-57,0)	
	Stop				
Idle stop	Full	350		(11,0-19,0)	
		440-490	0		
		100	min. 90,0		
End stop	Start	110-230			

1.84

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

F 17

Angle to the stop-plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 54 ± 8° γ = 30 - 8° δ = 60 + 8°	Pump Dimension ⌀ 1,0 mm Dimension ⌀ 24,65 mm

G18

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 FIA 3,6 a
4. Edition
En

Testoil-ISO 4113

VA 4/110 H 1600 CR 190
0 460 314 033

supersedes 6.82
company Fiat
engine 8040.04

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,5 mm ± 0,02 (± 0,04)
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	1000	4,6-5,4	mm		
1 2 Supply pump pressure	1000	5,2-5,7	kp/cm²		
1 3 Full-load delivery without charge-air pressure	700	67,0-68,0	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1 4 Idle speed regulation	300	9,0-15,0	cm³/1000 strokes		3,0
1 5 Start	100	mind. 110,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1750	41,0-49,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	700	1000	1400	1600
	mm	1,5-2,5 (1,3-2,7)	(4,3-5,7)	8,0-9,0 (7,8-9,2)	8,9-9,6 (8,5-9,9)
2 2 Supply pump	rev/min	400	1000	1600	
	kp/cm²	2,2-2,7 (2,0-2,9)	(5,0-5,9)	8,1-8,6 (7,9-8,8)	
Overflow delivery	rev/min	500		1600	
	cm³/10 s	55-100 (40-110)		55-100 (40-110)	

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1900-2000	0		
		1750		(40,0-50,0)	
		1600	59,5-62,5	(58,5-63,5)	
		1000	67,0-70,0	(66,0-71,0)	
		700		(66,5-68,5)	
		500	56,5-59,5	(55,5-60,5)	
	Stop	1600	0		
Idle stop	Full	330-380	0		
		300		(8,0-16,0)	
	Start	100	mind. 110,0		
End stop		300-400			

1.84

Angle to the stop-plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 50 ± 8° γ = 30 - 8° δ = 60 + 8°	Pump Dimension IV 5,2 mm Dimension V 24,65 mm

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 STE 2,6 a
3. Edition
En

Testoil-ISO 4113

VA 3/10 H 1200 CR 411
0 460 303 158

superseded 10.81
company Steyr
engine WO 311.40

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Instructions and Test Equipment
VDT-WPP '61 4 B

Pre-stroke setting 0,5 mm ± 0,02 (± 0,04)

Pre-setting see reverse side

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm
1.1 Timing device travel	1000	5,6-6,6	mm		
1.2 Supply pump pressure	1000	4,9-5,3	kp/cm²		
1.3 Full load delivery without charge-air pressure	1150	65,5-66,5	cm³/1000 strokes		2,5
Full load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	300	12,0-18,0	cm³/1000 strokes		3,0
1.5 Start	100	mind. 70,0	cm³/1000 strokes		
1.6 Full load speed regulation	1300	36,0-44,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min	-	700	1000
	mm	Beginn	2,7-3,7 (2,4-4,0)	(5,4-6,8)
2.2 Supply pump	rev/min	200	1000	1200
	kp/cm²	1,2-1,6 (1,0-1,8)	(4,7-5,5)	5,6-6,0 (5,4-6,2)
Overflow delivery	rev/min	500		1200
	cm³/10 s	55-100 (40-110)		55-100 (40-110)

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes	Charge-air pressure kp/cm²
End stop	Full	1360-1410	0	
		1300		(35,0-45,0)
		1150		(65,0-67,0)
		1000	68,5-70,5	(67,5-71,5)
		500	54,5-57,5	(53,5-58,5)
	Stop	1200	0	
Idle stop	Full	380-430	0	
		300		(11,0-19,0)
	Start	100	mind. 70,0	
End stop		170-250		

1.84

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Angle to the stop plate	Pre-setting dimensions
Pump = 25 ± 4° = 44 ± 8° = 30 - 8° = 60 + 8°	Pump Dimension IV = 2,70 mm Dimension V = 24,65 mm

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 PER 5,8 c 2

3. Edition

9.82

En

VE 6/12 F 1300 L 21-3

0 460 426 022

DHK: 1 688 901 020

supersedes

company Perkins

engine T 6.354.4

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	800	3,8-4,2	mm	0,8	
1.2 Supply-pump pressure	800	4,4-5,0	bar (kgf/cm²)	0,8	
1.3 Full-load delivery with charge-air pressure	1000	99,5-100,5	cm³/1000 strokes	0,8	3,5
Full-load delivery without charge-air pressure	500	72,0-73,0	cm³/1000 strokes	0	
1.4 Idle regulation	270	8,0-12,0	cm³/1000 strokes	0	3,5
1.5 Full-speed regulation	1480	47,0-53,0	cm³/1000 strokes	0,8	
1.6 Start	100	min. 90,0	cm³/1000 strokes	0	
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,8 bar	n = rev/min	500	800	1300
	mm	0,9-1,7(0,6-2,0)	(3,3-4,7)	4,6-5,3(4,2-5,6)
2.2 Supply pump LDA=0,8 bar	n = rev/min	500		1300
	bar (kgf/cm²)	3,1-3,7		6,4-7,0
Overflow delivery	n = rev/min	500		1300 (0,8 bar)
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	1650	max. 1,0		0,8
	1550	7,0-15,0	(6,0-16,0)	0,8
	1480		(45,0-55,0)	0,8
	1300	91,0-94,0	(87,5-97,5)	0,8
	1000		(97,0-103,0)	0,8
	*700	80,5-81,5	(77,2-84,8)	0,2
	500		(68,7-76,3)	0
switch-off	1300	0		
Idle stop	400	max. 1,0		
	320	min. 1,0		
	270		(5,0-15,0)	
End stop	120	min. 90,0		
	250	max. 74,0		

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,1-5,3
MS	0,9-1,1
SVS	max.6,0
AXK	20,2-22,2
BXL	11,7-15,1

Observations

* Manifold-pressure compensator stroke = 4,5 mm
Correction at the adjusting nut. (46)

2.4 Solenoid

max. cut-in voltage xxx min. 10 V

test voltage xxxxxxxxxx rated voltage 12V.

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 REN 2,0 b
2. Edition
En

VE 4/9 F 2250 R 41
0 460 494 027

Overflow temperature 45° C

supersedes –
company Renault
engine 852

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting --- mm

1. Settings

	Rot speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1 1 Timing device travel	1400	4,4-4,8	mm		
1 2 Supply-pump pressure	1400	4,9-5,5	bar (kgf/cm²)		
1 3 Full-load delivery with charge-air pressure	1400	39,0-40,0	cm³/1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	--	--	cm³/1000 strokes		
1 4 Idle regulation	400	7,5-11,5	cm³/1000 strokes		2,5 (3,0)
1 5 Full-speed regulation	2400	17,0-23,0	cm³/1000 strokes		
1 6 Start	100	min. 52,0	cm³/1000 strokes		
1 7 Load-dependent port-closing	1400	--			

2. Test Specifications

checking values in brackets ( )

2 1 Timing device	n = rev/min	1000	1400	2000
	mm	2,6-3,4 (2,3-3,7)	(3,9-5,3)	6,7-7,5 (6,4-7,8)
2 2 Supply pump	n = rev/min	1000		2000
	bar (kgf/cm²)	3,9-4,5		6,5-7,1
Overflow delivery	n = rev/min	500		2250
	cm³/10 s	55-110 (40-125)		55-110 (40-125)

2.3 Fuel deliveries

Speed control lever	Rot speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2550	max. 2,0	
	2400		(16,0-24,0)
	2200	31,5-33,5	(30,2-34,8)
	2100	32,5-34,5	(31,2-35,8)
	1400		(37,2-41,8)
	1000	35,5-38,5	(34,0-40,0)
switch-off	2250	0	
Idle stop	650	max. 5,0	
	400		(5,5-13,5)
End stop	320	min. 45,0	
	430	max. 45,0	

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,4-1,6
SVS	max. 3,5
A XK	20,1-22,1
B XL	9,5-13,3

Observations

2 4 Solenoid

max. cut-in voltage xxx min. 10,0 V
test voltage xxxxxxxxx rated voltage 12V.

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 REN 2,0 d
3. Edition
En

VE 4/9 F 2200 R 69
0 460 494 055

Overflow temperature 45° C

supersedes 3.83
company: Renault
engine: J 8 S - 702

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	3,9-4,3	mm	0,74	
1.2 Supply-pump pressure	1400	5,1-5,7	bar (kgf/cm²)	0,74	
1.3 Full-load delivery with charge-air pressure	600	35,0-36,0	cm³/1000 strokes	0	
Full-load delivery without charge-air pressure	1400	50,0-51,5	cm³/1000 strokes	0,74	2,5 (3,0)
1.4 Idle regulation	350	9,0-13,0	cm³/1000 strokes	0	2,5 (3,0)
1.5 Full-speed regulation	2400	23,0-29,0	cm³/1000 strokes	0,74	
1.6 Start	100	min.60,0	cm³/1000 strokes	0	
1.7 Load-dependent port-closing	–	–			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	1800	2000
	mm	1,8-2,6(1,5-2,9)	(3,4-4,8)	5,6-6,4(5,3-6,7)	6,2-7,0(5,9-7,8)
2.2 Supply pump	n = rev/min	400		1800	
	bar (kgf/cm²)	1,9-2,5		6,3-6,9	
Overflow delivery	n = rev/min	500			2200
	cm³/10 s	55-138(40-153)			55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2700	max. 2,0		0,74
	2500	max.17,5		0,74
	2400		(22,0-30,0)	0,74
	2000	42,5-44,5	(41,2-45,8)	0,74
	1400		(48,2-52,8)	0,74
	1000	45,0-48,0	(43,5-49,5)	0,74
	700	40,0-41,0	/37,5-43,5)	0,2
	600		(32,5-38,5)	0
switch-off	2200			
Idle stop	480	max.2,0		
	375	4,0-8,0	(2,0-10,0)	
	350		(7,0-15,0)	
End stop	180	min. 40		
	300	max. 40		

2.4 Solenoid: max. cut-in voltage xxx min. 10,0 V
test voltage xxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,4-1,6
SVS	max.5,3
AXK	20,2-22,2
BXL	9,1-12,4

Observations

HA

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 PEU 2,5 a

1. Edition

En

VE 4/9 F 2250 R 84
0 460 494 079

DHK: 1 688 901 022/130 bar

Test pressure line
6x2x450 mm / 1 680 750 073

Overflow temperature 45° C

supersedes
company: Peugeot
engine: XD 3

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	5,4-5,8	mm		
1.2 Supply-pump pressure	1500	5,5-6,1	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1500	37,5-38,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle regulation	400	6,0-10,0	cm³/1000 strokes		2,5 (3,0)
1.5 Full-speed regulation	2325	23,5-29,5	cm³/1000 strokes		
1.6 Start	100	min. 45	cm³/1000 strokes		
1.7 Load-dependent port-closing	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	700	1000	1500	2000
	mm	0,6-1,4(0,3-1,7)	2,5-3,1(2,1-3,5)	(4,9-6,3)8,1-8,9(7,8-9,2)	
2.2 Supply pump	n = rev/min	400		2200	
	bar (kgf/cm²)	2,1-2,7		7,5-8,1	
Overflow delivery	n = rev/min	400		2250	
	cm³/10 s	55-138 (40-153)		55-138 (40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2550	max. 2,0	
	2450	4,0-12,0 (4,0-12,0)	
	2325	(22,5-30,5)	
	2200	39,6-41,6(38,3-42,9)	
	2000	38,9-40,9(37,6-42,2)	
	1500	(35,7-40,3)	
	1000	37,1-39,7(35,4-41,4)	
	600	36,3-39,3(34,8-40,8)	
switch-off			
Idle stop	400	(4,0-12,0)	
	440	max. 2,0	
End stop	350	min. 45	
	450	max. 45	

3. Dimensions

for assembly and adjustment mm

Designation	
K	K 1
KF	5,2-5,4
MS	0,9-1,2
SVS	3,3
A	
B	

Observations

2.4 Solenoid

max. cut-in voltage xxx min. 10 V

test voltage xxxxxxxxx rated voltage 12V.

H2

112

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 STE 4,0 f

2. Edition

En

VE 4/11 F 1200 R 94

0 460 414 003

Overflow temperature 45° C

supersedes: -

company: Steyr

engine: WD 411.85

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/.

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1000	4,8-5,2	mm		
1.2 Supply-pump pressure	1000	5,6-6,2	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1180	65,5-66,5	cm³/1000 strokes		3,5(4,0)
Full-load delivery without charge-air pressure	300	18,0-22,0	cm³/1000 strokes		3,5(4,0)
1.4 Idle regulation	1300	9,5-15,5	cm³/1000 strokes		
1.5 Full-speed regulation	100	min. 80,0	cm³/1000 strokes		
1.6 Start	-	-			
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	600	1000	1180
	mm	1,4-2,2(1,1-2,5)	(4,3-5,7)	6,3-7,1(6,0-7,4)
2.2 Supply pump	n = rev/min	500		1180
	bar (kgf/cm²)	3,0-3,6		6,6-7,2
Overflow delivery	n = rev/min	500		1200
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1370	max. 1,0		
	1320	min. 1,5		
	1300		(8,0-17,0)	
	1180		(63,4-68,6)	
	1000	63,0-65,0	(60,6-67,4)	
	500	56,0-59,0	(54,1-60,9)	
switch-off	1200	0		
Idle stop	410	max. 1,0		
	350	min. 1,5		
	300		(15,5-24,5)	
End stop	170	min. 80,0		
	250	max. 60,0		

2.4 Solenoid

max. cut-in voltage XXX min. 10 V

test voltage XXX rated voltage 12V.

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,2-5,4
MS	0,9-1,1
SVS	max.3,0
XK	20,2-22,2
XL	10,3-13,8

Observations

H3

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

02.84

H3

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 STE 6,5 a
2. Edition
En

VE 6/11 F 1300 R 98

0 460 416 021

Overflow temperature 45° C

supersedes -
company Steyr
engine WD 612.01

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	~~1000~~	2,4-2,6	mm		
1.2 Supply-pump pressure	1000	6,1-6,7	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1280	65,0-66,0	cm³/1000 strokes		3,5(4,0)
Full-load delivery without charge-air pressure	300	14,0-18,0	cm³/1000 strokes		3,5(4,0)
1.4 Idle regulation	1450	18,0-24,0	cm³/1000 strokes		
1.5 Full-speed regulation	100	min. 95,0	cm³/1000 strokes		
1.6 Start	-	-			
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	700	1000	1280
	mm	0,6-1,4(0,3-1,7)	(1,9-3,3)	3,6-4,4(3,3-4,7)
2.2 Supply pump	n = rev/min	300		1300
	bar (kgf/cm²)	3,4-4,0		7,2-7,8
Overflow delivery	n = rev/min	500		1300
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	1550	max. 1,0	
	1500	min. 1,5	
	1450	(16,5-25,5)	
	1280	(62,9-68,1)	
	1000	72,0-74,0 (69,6-76,4)	
	500	68,5-72,5 (67,1-73,9)	
switch-off	1300	0	
Idle stop	430	max. 1,0	
	360	min. 1,5	
	300	(11,5-20,5)	
End stop	170	min. 95,0	
	250	max. 73,0	

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,4-5,6
MS	1,3-1,5
SVS	max.6,0
XK	20,2-22,2
XL	8,7-12,0

Observations

2.4 Solenoid

max. cut-in voltage XXX min. 10V

rated voltage XXXX rated voltage 12V.

02.84

⑥

Test Specifications Distributor-type Fuel-injection Pumps

En

46

WPP 001/4 IBE 4,0a

2. Edition

VE 4/12 F 1300 R 103

0 460 424 004

supersedes company: Iberica
engine: T 4.236

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Pre-stroke setting 0,3 mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1000	4,0-4,4	mm	0,8	
1.2 Supply-pump pressure	1000	5,5-6,1	bar (kgf/cm²)	0,8	
1.3 Full-load delivery with charge-air pressure	500	66,0-67,0	cm³/1000 strokes	0	
Full-load delivery without charge-air pressure	800	94,0-95,0	cm³/1000 strokes	0,8	4,0 (4,5)
1.4 Idle regulation	300	6,0-12,0	cm³/1000 strokes	0	3,5 (4,5)
1.5 Full-speed regulation	1400	64,0-72,0	cm³/1000 strokes	0,8	
1.6 Start	100	min. 70,0	cm³/1000 strokes	0	
1.7 Load-dependent port-closing	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,8 bar	n = rev/min	500	1000	1300
	mm	0,4-1,2(0,1-1,5)	(3,5-4,9)	5,6-6,4 (5,3-6,7)
2.2 Supply pump LDA=0,8 bar	n = rev/min	500		1300
	bar (kgf/cm²)	3,3-3,9		6,7-7,3
Overflow delivery	n = rev/min	500		1300
	cm³/10 s	55-110(40-125)		55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	1640	max. 1,0	0,8
	1580	max. 5,0	0,8
	1400	(63,0-73,0)	0,8
	1300	84,5-87,5(83,0-89,0)	0,8
	800	(91,5-97,5)	0,8
	*800	91,0-92,0(87,7-95,3)	0,42
	500	(62,7-70,3)	0
switch-off			
Idle stop	430	max. 1,0	
	370	max. 3,0	
	300	(4,0-14,0)	
End stop	110	min. 70,0	
	210	max. 70,0	

2.4 Solenoid — max cut-in voltage xxxx min. 10,0 V
xxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	--
KF	5,1-5,4
MS	1,1-1,35
SVS	5,0
XK	20,2-22,2
XL	8,6-11,9

Observations *

Manifold-pressure compensator stroke = 4,2 mm
Correction at the adjusting nut. (46)

01.84

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 STE 6,5 d

2. Edition

En

VE 6/12 F 1100 R 122

0 460 426 029

Overflow temperature 45° C

supersedes 01.83
company Steyr
engine WD 612.87

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	800	4,8-5,2	mm		
1.2 Supply-pump pressure	800	5,8-6,4	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1080	80,8-81,8	cm³/1000 strokes		3,5
Full-load delivery without charge-air pressure	300	14,0-18,0	cm³/1000 strokes		3,5
1.4 Idle regulation	1200	11,0-17,0	cm³/1000 strokes		
1.5 Full-speed regulation	100	min. 95,0	cm³/1000 strokes		
1.6 Start					
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	500	800	1080
	mm	1,3-2,1(1,0-2,4)	(4,3-5,7)	6,9-7,7(6,6-8,0)
2.2 Supply pump	n = rev/min	500		1080
	bar (kgf/cm²)	4,3-4,9		7,2-7,8
Overflow delivery	n = rev/min	500		1100
	cm³/10 s	55-138(40-153)		55-138(40-153

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	1250	max.1,0	
	1200	(9,0-19,0	
	1150	45,5-54,5 (45,0-55,0)	
	1080	(78,0-84,3)	
	800	80,0-82,0 (78,0-84,0)	
	500	78,5-81,5 (76,3-83,7)	
switch-off	1100	0	
Idle stop	450	max. 1,0	
	350	0,5-6,5	
	300	(11,0-21,0)	
End stop	170	min. 100	
	250	max. 75	

2.4 Solenoid — max. cut-in voltage xxxx min. 10 V; test voltage xxxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	max.6,0
A	
B	

Observations

H6

02.84

H6

⑥ # Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 REN 2,0 h

2. Edition

En

supersedes 10.83
company REN
engine I8S-234

VE 4/9 F 2100 R 130

0 460 494 128

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
	~~1400~~	~~4,0-4,4~~		~~0,8~~	
1.1 Timing device travel	1400	5,1-5,7	mm	0,8	
1.2 Supply-pump pressure			bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1400	46,0-47,0	cm³/1000 strokes	0,8	2,5(3,0)
				0	
Full-load delivery without charge-air pressure	600	30,3-31,3	cm³/1000 strokes	0	2,5(3,0)
1.4 Idle regulation	375	4,0-8,0	cm³/1000 strokes	0,8	
1.5 Full-speed regulation	2300	18,0-24,0	cm³/1000 strokes	0	
1.6 Start	100	min. 50,0	cm³/1000 strokes		
1.7 Load-dependent port-closing	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,8 bar	n = rev/min	1000	1400	1800	2000
	mm	1,9-2,7(1,6-3,0)	(3,5-4,9)	5,8-6,6(5,5-6,9)	6,1-6,9(5,8-7,2)
2.2 Supply pump LDA=0,8 bar	n = rev/min	400		1800	
	bar (kgf/cm²)	1,9-2,5		6,3-6,9	
Overflow delivery	n = rev/min	500		2100	
	cm³/10 s	55-138(40-153)		55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2600	max. 2,0		0,8
	2400	max. 14,0		0,8
	2300		(17,0-25,0)	0,8
	2000	38,0-41,0	(37,2-41,8)	0,8
	1400		(44,2-48,8)	0,8
	1000	41,5-44,5	(40,0-46,0)	0,8
	700 *	35,3-36,3	(32,8-38,8)	0,2
	600		(27,8-33,8)	0
switch-off eléctr.	400	0		
Idle stop	350	9,0-13,0	(7,0-15,0)	
	375		(2,0-10,0)	
	480	max. 2,0		
End stop	170	min. 40		
	300	max. 40		

2.4 Solenoid	
max. cut-in voltage	xxx min. 10 V
~~test voltage~~ xxx	rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,4-1,6
SVS	5,5
A XK	20,2-22,2
B XL	7,7-11,0

Observations

Manifold-pressure
*compensator stroke
= 4,5 mm
Correction at the
adjusting nut. (46)

02.84

H7

BOSCH
Geschaftsbereich KH Kundendienst Kfz-Ausrustung

⑥

Test Specifications Distributor-type Fuel-injection Pumps

En

46

WPP 001/4 MAN 5,6 g

1. Edition

VE 6/12 F 1400 R 132

0 460 426 032

supersedes –

company MAN

engine D 0226 MK 141 kW

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting 0,2 mm ± 0,02 mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	800	3,1-3,5	mm	1,0	
	800	5,2-5,8	bar (kgf/cm²)	1,0	
1.2 Supply-pump pressure	1000	119,0-120,0	cm³/1000 strokes	1,0	4,0(4,5)
1.3 Full-load delivery with charge-air pressure	630	81,0-82,0	cm³/1000 strokes		
Full-load delivery without charge-air pressure	300	10,0-16,0	cm³/1000 strokes		3,5(4.5)
1.4 Idle regulation	1440	104,0-112,0	cm³/1000 strokes	1,0	
1.5 Full-speed regulation	100	min. 75,0	cm³/1000 strokes		
1.6 Start	800			1,0	
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	500	800	1100
	mm	1,5-2,3(1,2-2,6)	(2,6-4,0)	4,2-5,0(3,9-5,3)
2.2 Supply pump	n = rev/min	200		1400
	bar (kgf/cm²)	2,3-2,9		7,3-7,9
Overflow delivery	n = rev/min			1400
	cm³/10 s			55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	1620	max. 3,0		1,0
	1550	32,0-40,0	(31,0-41,0)	1,0
	1440		(103,0-113,0)	1,0
	1400	115,5-118,5	(114,0-120,0)	1,0
	1000		(116,5-122,5)	1,0
	800	121,0-125,0	(119,2-126,8)	1,0
	630	118,0-122,0	(116,2-123,8)	1,0
	*630	111,5-112,5	(108,2-115,8)	0,4
	630	81,0-82,0	(77,7-85,3)	0
switch-off				
Idle stop	400	max. 2,0		
	350	max. 5,0		
	300		(8,0-18,0)	
End stop	320	min.90,0		
	430	max. 90,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V

test voltage xxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	–
KF	5,7-6,0
MS	1,0-1,25
SVS	2,7
A	
B	

Observations

*Manifold-pressure compensator stroke = 7,5 mm
Correction at the adjusting nut. (46)

H8

Test Specifications Distribu r-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 V 5

2. Edition

En

VE 4/9 F 2250 R 134-1

0 460 494 134

supersedes 7.83
company VWW
engine 086 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,3-3,7	mm	0,75	
1.2 Supply pump pressure	1500	4,6-5,2	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	22,5-23,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	42,5-43,5	cm³/1000 strokes	0,75	2,5 (3,0)
1.4 Idle speed regulation	450	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Start	100	min. 35,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2525	9,0-15,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75 bar	n = rev/min	1000	1500	2250
	mm	1,3-2,1(1,0-2,4)	(2,8-4,2)	6,0-6,8(5,7-7,1)
2.2 Supply pump LDA=0,75 bar	n = rev/min	600		2250
	bar (kgf/cm²)	2,5-3,1		6,5-7,1
Overflow delivery	n = rev/min	600		2250 (0,75 bar)
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2750	max. 3,0		0,75
	2525		(8,0-16,0)	0,75
	2250	38,0-40,0	(36,8-41,2)	0,75
	1500		(40,8-45,2)	0,75
	1000 *	32,5-33,5	(30,8-35,2)	0,3
	600		(20,0-26,0)	0
switch-off mech.	2250	0		
elektr.	400	0		
Idle stop	450		(4,0-12,0)	
	1200	max. 9,0		
End stop	400	min. 21,0		
	500	max. 29,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V; max. xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,2-1,4
SVS	5,7
A	
B	

Observations

* Manifold-pressure compensator stroke = 4,0 mm
Correction at the adjusting nut. (46)

Test Specifications Distributor-type Fuel-injection Pumps

En

WPP 001/4 VWW 1,6 V 6
2. Edition

VE 4/9 F 2250 R 134-2
0460 494 135

supersedes 7.83
company VWW
engine 086 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,3 - 3,7	mm	0,75 bar	
1.2 Supply pump pressure	1500	4,6-5,2	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	22,5-23,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	42,5-43,5	cm³/1000 strokes	0,75	2,5 (3,0)
1.4 Idle speed regulation	475	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Start	100	min. 35,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2525	9,0-15,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2250
LDA = 0,75bar	mm	2,3-2,1(1,0-2,4)	(2,8-4,2)	6,0-6,8 (5,7-7,1)
2.2 Supply pump	n = rev/min	600		2250
LDA = 0,75bar	bar (kgf/cm²)	2,5-3,1		6,5-7,1
Overflow delivery	n = rev/min	600		2250 (0,75 bar)
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2750	max. 3,0		0.75 bar
	2525		(8,0-16,0)	0,75 bar
	2250	38,0-40,0	(36,8-41,2)	0,75 bar
	1500		(40,8-45,2)	0,75 bar
*	1000	32,5-33,5	(30,8-35,2)	0
	600		(20,0-26,0)	
switch-off elektr.	400	0		
Idle stop	475		(4,0-12,0)	
	1200	max. 4,0		
End stop	400	min. 21,0		
	500	max. 29,0		

2.4 Solenoid

max. cut-in voltage xxxx min. 10,0 V
test voltage xxxxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,2-1,4
SVS	3,2
A	
B	

Observations

*Manifold-pressure compensator stroke = 4,0 mm
Correction at the adjusting nut. (46)

12.83

H10

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 W 6

2. Edition

En

VE 4/9 F 2250 R 134-4

0 460 494 137

supersedes 10.83
company VWW
engine 086 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings

	Rot speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1 1 Timing device travel	1500	3,2-3,7	mm	0,75	
1 2 Supply pump pressure	1500	4,6-5,2	bar (kgf/cm²)	0,75	
1 3 Full-load delivery without charge-air pressure	600	22,5-23,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	42,5-43,5	cm³/1000 strokes	0,75	2,5 (3,0)
1 4 Idle speed regulation	475	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1 5 Start	100	min. 35	cm³/1000 strokes	0	
1 6 Full-load speed regulation	2525	9,0-15,0	cm³/1000 strokes	0,75	
1 7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2 1 Timing device LDA=0,75 bar	n = rev/min	1000	1500	2250
	mm	1,3-2,1(1,0-2,4)	(2,8-4,2)	6,0-6,8(5,7-7,1)
2 2 Supply pump LDA=0,75 bar	n = rev/min	600		2250
	bar (kgf/cm²)	2,5-3,1		6,5-7,1
Overflow delivery	n = rev/min	600 (0 bar)		2250 (0,75 bar)
	cm³/10 s	55-138 (40-153)		55-138(40-153)

2 3 Fuel deliveries

Speed control lever	Rot speed rev/min		Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2750		max. 3,0		0,75
	2525			(8,0-16,0)	0,75
	2250		38,0-40,0	(36,7-41,3)	0,75
	1500			(40,7-45,3)	0,75
	1000	*	32,5-33,5	(30,7-35,3)	0,30
	600			(20,0-26,0)	0
switch-off elect.	400		0		
Idle stop	475			(4,0-12,0)	
	1200		max. 4,0		
	1125	**	22,0-24,0		
End stop	400		min. 21		
	500		max. 29		

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,7-6,0
MS	1,2-1,4
SVS	3,2
A	
B	

Observations

Please note instructions on sheet 2

2.4 Solenoid

max. cut-in voltage

test voltage

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

* Manifold-pressure compensator stroke = 4,0

** Setting point for EGR

Pull control lever toward full load untill gauge fits over driver and housing cover web. Measure delivery.

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 V 9
2. Edition
En

VE 4/9 F 2400 R 138
0 460 494 131

Overflow temperature 45° C

supersedes 7.83
company VWW
engine 086

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Testoil-ISO 4113

Pre-stroke setting mm

1. Settings

	Rot speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9 - 3,3	mm		
1.2 Supply-pump pressure	1500	4,3 - 4,9	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1500	33,0-34,0	cm³/1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	-		cm³/1000 strokes		
1.4 Idle regulation	475	6,0-10,0	cm³/1000 strokes		2,0 (3,0)
1.5 Full-speed regulation	100	min- 35,0	cm³/1000 strokes		
1.6 Start	2600	11,0-17,0	cm³/1000 strokes		
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2400
	mm	1,3-2,1(1,0-2,4)	(2,4-2,8)	6,1-6,9(5,8-7,2)
2.2 Supply pump	n = rev/min	600		2400
	bar (kgf/cm²)	2,2-2,8		6,4-7,0
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2800	max. 3,0	
	2600	(10,0-18,0)	
	2400	27,5-29,5(26,3-30,7)	
	1500	(31,3-35,7)	
	600	21,5-24,5(20,0-26,0)	
switch-off electr.	400	0	
Idle stop	475	(4,0-12,0)	
	650	max. 6,0	
	1200	max. 5,0	
End stop	400	min.18,0	
	500	max.23,5	

2.4 Solenoid	cut-in voltage	min 10,0 V rated voltage 12V

3. Dimensions

for assembly and adjustment mm

Designation	mm
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	2,7
* FH	1,8-2,4
A	
B	

Observations

*operating stroke (cold-start accel.)

12.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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H13

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 W 2

2. Edition

En

VE 4/9 F 2400 R 138-1

0 460 494 140

supersedes 7/83
company VWW
engine 086

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting - mm

1. Settings

	Rot speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9-3,3	mm		
1.2 Supply pump pressure	1500	4,3 - 4,9	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	33,0-34,0	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	450	6,0-10,0	cm³/1000 strokes		2,0 (3,0)
1.5 Start	100	min. 35,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2400
	mm	1,3-2,1 (1,0-2,4)	(2,4-3,8)	6,1-6,9 (5,8-7,2)
2.2 Supply pump	n = rev/min	600		2400
	bar (kgf/cm²)	2,2-2,8		6,4-7,0
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2800	max. 3,0	
	2600	(10,0-18,0)	
	2400	27,5-29,5 (26,3-30,7(	
	1500	(31,3-35,7)	
	600	21,5-24,5 (20,0-26,0)	
switch-off mech.	2400	0	
switch-off elektr.	400	0	
Idle stop	450	(4,0-12,0)	
	650	max. 5,0	
	1200	max. 7,0	
End stop	400	min. 18,0	
	500	max. 23,5	

2.4 Solenoid — max cut-in voltage xxxx min. 10 V; test voltage rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	2,7
*FH	1,8-2,4
A	
B	

Observations
*operating stroke (KSB)

12.83

H14

H14

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 IHC 3,9 y
1. Edition

En

VE 4/11 F 1150 R 140
0 460 414 009

supersedes
Nozzle-and-holder assembly company IHC
1 688 901 020 (172 + 3 bar) engine DT 239/856

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Testnil-ISO 4113

Pre-stroke setting 0,2 mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	800	4,5-4,9	mm	0,8 bar	
1.2 Supply-pump pressure	800	5,3-5,9	bar (kgf/cm²)	0,8 bar	
1.3 Full-load delivery with charge-air pressure	500	76,5-77,5	cm³/1000 strokes	0	
Full-load delivery without charge-air pressure	800	95,5-96,5	cm³/1000 strokes	0,8 bar	3,5 (4,0)
1.4 Idle regulation	350	28,0-32,0	cm³/1000 strokes	0	3,5 (4,0)
1.5 Full-speed regulation	1250	27,0-33,0	cm³/1000 strokes	0	
1.6 Start	100	min. 100	cm³/1000 strokes	0,8 bar	
1.7 Load-dependent port-closing	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA = 0,8 bar	n = rev/min	400	800	1150
	mm	0,8-1,6 (0,5-1,9)	(4,0-5,4)	5,3-6,1 (5,0-6,4
2.2 Supply pump LDA = 0,8 bar	n = rev/min	400		1150
	bar (kgf/cm²)	3,7-4,3		6,4-7,0
Overflow delivery	n = rev/min	500		1150 (0,8 bar)
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	1300	max. 2,5		0,8 bar
	1250		(25,5-34,5)	0,8 bar
	1130	88,0-91,0	(86,9-92,1)	0,8 bar
	800		(93,4-98,6)	0,8 bar
	750 *	88,5-89,5	(85,6-92,4)	0,3 bar
	500		(73,6-80,4)	0
switch-off				
Idle stop	350		(25,5-34,5)	
	400	10,0-16,0	(8,5-17,5)	
	450	max. 3,0		
End stop	220	min. 100		
	300	max. 80		

2.4 Solenoid — max. cut-in voltage xxxxxxxxx test voltage — xxxx min. 10 V rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	
KF	5,2-5,4
MS	1,2-1,4
SVS	5,0
AXK	20,2-22,2
BXL	12,3-15,7

Observations

* Manifold-pressure compensator stroke = 4,9 mm
Correction at the adjusting nut. (46)

12.83

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 FIA 1,9 e

1. Edition

En

VE 4/9 F 2300 R 141

0 460 494 132

DHK: 1 688 901 022/130 bar

Test pressure line
6x2x450 mm / 1 680 750 073

Overflow temperature 45° C

superseded
company Fiat
engine X 8/43

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting — mm

Testoil ISO 4113

1. Settings

	Rot. speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1 1 Timing device travel	1500	4,3-4,7	mm		
1 2 Supply-pump pressure	1500	5,6-6,2	bar (kgf/cm²)		
1 3 Full-load delivery with charge-air pressure	1500	31,0-32,0	cm³/1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	-	-	cm³/1000 strokes		
1 4 Idle regulation	350	9,0-13,0	cm³/1000 strokes		2,5(3,0)
1 5 Full-speed regulation	2500	11,0-17,0	cm³/1000 strokes		
1 6 Start	100	min. 55,0	cm³/1000 strokes		
1 7 Load-dependent port-closing	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	800	1500	2300
	mm	1,7-2,5(1,4-2,8)	(3,8-5,2)	7,1-7,9(6,8-8,2)
2.2 Supply pump	n = rev/min	400		2300
	bar (kgf/cm²)	2,8-3,4		7,4-8,0
Overflow delivery	n = rev/min	400		2300
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2600	6,2-6,8 (6,1-6,9)	
	2500	(10,0-18,0)	
	2400	21,0-27,0(20,0-28,0)	
	2250	32,7-34,7(31,4-36,0)	
	1500	(29,2-33,8)	
	1000	30,7-33,3(29,0-35,0)	
	600	32,0-35,0(30,5-36,5)	
switch-off			
Idle stop	350	(7,0-15,0)	
	400	max. 4,0	
	540	0	
End stop	300	min. 45,0	
	400	max. 46,0	

3. Dimensions

Designation	for assembly and adjustment mm
K	3,1-3,4
KF	5,7-5,9
MS	1,7-1,9
SVS	2,8
XK A	20,2-22,2
XL B	10,3-13,7

Observations

2.4 Solenoid — max. cut-in voltage xxx min. 10 V

xxx rated voltage 12V.

12.83

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 REN 2,0 k
1. Edition

En

VE 4/9 F 2200 R 153
0 460 494 141

supersedes –
company Renault
engine J8S-709

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/.

Pre-stroke setting mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	3,9- 4,3	mm	0,8	
1.2 Supply-pump pressure	1400	5,1- 5,7	bar (kgf/cm²)	0,8	
1.3 Full-load delivery with charge-air pressure	1400	50,0-51,0	cm³/1000 strokes	0,8	2,5 (3,0)
Full-load delivery without charge-air pressure	600	35,0-36,0	cm³/1000 strokes	0	
1.4 Idle regulation	350	9,0-13,0	cm³/1000 strokes	0	2,5 (3,0)
1.5 Full-speed regulation	2400	23,0-29,0	cm³/1000 strokes	0,8	
1.6 Start	100	min. 60,0	cm³/1000 strokes	0	
1.7 Load-dependent port-closing	–				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	1800	2000
	mm	1,8-2,6(1,5-2,9)	(3,4-4,8)	5,6-6,4(5,3-6,7)	6,2-7,0(5,9-7,3)
2.2 Supply pump	n = rev/min	400		1800	
	bar (kgf/cm²)	1,9-2,5		6,3-6,9	
Overflow delivery	n = rev/min	300		2200	
	cm³/10 s	55-138(40-153)		55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2700	max. 2,0		0,8
	2500	max. 17,5		0,8
	2400		(22,0-30,0)	0,8
	2000	42,5-44,5	(41,2-45,8)	0,8
	1400		(48,2-52,8)	0,8
	1000	45,0-48,0	(43,5-49,5)	0,8
	*700	40,0-41,0	(37,5-43,5)	0,2
	600		(32,5-38,5)	0
switch-off	2200	0		
Idle stop	480	max. 2,0		
	375	4,0-8,0	(2,0-10,0)	
	350		(7,0-15,0)	
End stop	180	min. 40,0		
	300	max. 40,0		

2.4 Solenoid — max. cut-in voltage / test voltage

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,4-1,6
SVS	3,6
A	
B	

Observations

*Manifold-pressure compensator stroke = 4,5 mm
Correction at the adjusting nut. (46)

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Test Specifications Distributor-type Fuel-injection Pumps

En

WPP 001/4 REN 2,0 k 1

1. Edition

VE 4/9 F 2200 R 153-1

0460 494 156

supersedes –

company: Renault

engine: J8S-T 01

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	3,9 - 4,3	mm	0,8	
1.2 Supply-pump pressure	1400	5,1 - 5,7	bar (kgf/cm²)	0,8	
1.3 Full-load delivery with charge-air pressure	1400	50,0 - 51,0	cm³/1000 strokes	0,8	2,5 (3,0)
Full-load delivery without charge-air pressure	600	35,0 - 36,0	cm³/1000 strokes	0	
1.4 Idle regulation	350	9,0 - 13,0	cm³/1000 strokes	0	2,5 (3,0)
1.5 Full-speed regulation	2400	23,0 - 29,0	cm³/1000 strokes	0,8	
1.6 Start	100	min. 60,0	cm³/1000 strokes	0	
1.7 Load-dependent port-closing					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	1800	2000	
	mm	1,8-2,6 (1,5-2,9)	(3,4-4,8)	5,6-6,4 (5,3-6,7)	6,2-7,0(5,9-7,3)	
2.2 Supply pump	n = rev/min	400		1800		
	bar (kgf/cm²)	1,9 - 2,5		6,3 - 6,9		
Overflow delivery	n = rev/min	500		2200		
	cm³/10 s	55-138 (40-153)		55-138 (40-153)		

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2700	max. 2,0	0,8
	2500	max. 17,5	0,8
	2400	(22,0-30,0)	0,8
	2000	42,5-44,5 (41,2-45,8)	0,8
	1400	(48,2-52,8)	0,8
	1000	45,0-48,0 (43,5-49,5)	0,8
	*700	40,0-41,0 (37,5-43,5)	0,2
	600	(32,5-38,5)	0
switch-off	2200	0	
Idle stop	480	max. 2.0	
	375	4,0-8,0 (2,0-10,0)	
	350	(7,0-15,0)	
End stop	180	min. 40,0	
	300	max. 40,0	

2.4 Solenoid — max. cut-in voltage xx min. 10 V

test voltage xxxxxxxxxrated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,4-1,6
SVS	3,6
A	
B	

Observations

* Manifold-pressure compensator stroke = 4,5 mm
Correction at the adjusting nut. (46)

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 FIA 1,9 d

1. Edition

En

VE 4/9 F 2300 L 157

0 460 494 144

DHK: 1 688 901 022/130 bar

Test pressure line
6x2x450 mm / 1 680 750 073

Overflow temperature 45° C

supersedes -
company Fiat
engine X8/48

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	4,3-4,7	mm		
1.2 Supply-pump pressure	1500	5,6-6,2	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1500	31,0-32,0	cm³/1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle regulation	350	9,0-13,0	cm³/1000 strokes		2,5 (3,0)
1.5 Full-speed regulation	2500	11,0-17,0	cm³/1000 strokes		
1.6 Start	100	min. 55,0	cm³/1000 strokes		
1.7 Load-dependent port-closing	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	800	1500	2000	2300
	mm	1,7-2,5(1,4-2,8)	(3,8-5,2)	5,8-6,4(5,4-6,8)	6,7-7,5(6,4-7,8)
2.2 Supply pump	n = rev/min	400		2300	
	bar (kgf/cm²)	2,9-3,5		7,4-8,0	
Overflow delivery	n = rev/min	400		2300	
	cm³/10 s	55-138(40-153)		55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2600	0,5-6,5	
	2500	(10,0-18,0)	
	2400	21,0-27,0(20,0-28,0)	
	2250	33,4-35,4(32,1-36,7)	
	1500	(29,2-33,8)	
	1000	30,7-33,3(29,0-35,0)	
	600	31,5-34,5(30,0-36,0)	
switch-off			
Idle stop	350	7,0-15,0)	
	400	0,5-6,5	
	450	max. 1,5	
End stop	300	min. 45,0	
	400	max. 46,0	

3. Dimensions

Designation	for assembly and adjustment mm
K	3,1-3,4
KF	5,7-6,0
MS	1,4-1,65
SVS	2,8
A	
B	

Observations

2.4 Solenoid

max. cut-in voltage xxx min. 10 V

test voltage xxxxxxxxx rated voltage 12V.

Test Specifications Distributor-type Fuel-injection Pumps

En

VE 4/9 F 2250 R 158
0 460 494 145

Overflow temperature 45° C

supersedes –
company Renault
engine J85-706

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/

Pre-stroke setting mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	4,4-4,8	mm		
1.2 Supply-pump pressure	1400	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1400	39,0-40,0	cm³/1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	–	–	cm³/1000 strokes		
1.4 Idle regulation	400	7,5-11,5	cm³/1000 strokes		2,5(3,0)
1.5 Full-speed regulation	2400	17,0-23,0	cm³/1000 strokes		
1.6 Start	100	min. 52,0	cm³/1000 strokes		
1.7 Load-dependent port-closing	–	–			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	2000
	mm	2,6-3,4(2,3-3,7)	(3,9-5,3)	6,7-7,5 (6,4-7,8)
2.2 Supply pump	n = rev/min	1000		2000
	bar (kgf/cm²)	3,9-4,5		6,5-7,1
Overflow delivery	n = rev/min	500		2250
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2250	max. 2,0	
	2400	(16,0-24,0)	
	2200	31,5-33,5(30,2-34,8)	
	2100	32,5-34,5(31,2-35,8)	
	1400	(37,2-41,8)	
	1000	35,5-38,5(34,0-40,0)	
switch-off	2250	0	
Idle stop	650	max. 5,0	
	400	(3,5-13,5)	
End stop	320	min. 45,0	
	430	max. 45,0	

3. Dimensions

for assembly and adjustment mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,4-1,6
SVS	max.3,6
A XK	
B XL	

Observations

2.4 Solenoid
max. cut-in voltage xx min. 10 V
test voltage ~~xxxxxxxxx~~ rated voltage 12V.

H20

H20

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 e

1. Edition

En

VE 4/9 F 2000 R 160

0 460 494 149

supersedes company VWW engine 068.5 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/

Pre-stroke setting mm

1. Settings

	Rot speed rev/min	Settings		Charge-air press bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,2-3,6	mm	0,75	
1.2 Supply-pump pressure	1500	5,5-6,1	bar (kgf/cm²)	0,75	
1.3 Full-load delivery with charge-air pressure	600	24,5-25,5	cm³/1000 strokes	0	
Full-load delivery without charge-air pressure	1500	41,5-42,5	cm³/1000 strokes	0,75	2,5 (3,0)
1.4 Idle regulation	475	6,0-10,0	cm³/1000 strokes	0	2,0 (3,0)
1.5 Full-speed regulation	2110	9,0-15,0	cm³/1000 strokes	0,75	
1.6 Start	100	min. 35,0	cm³/1000 strokes	0	
1.7 Load-dependent port-closing	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75bar	n = rev/min	1000	1500	1980
	mm	1,2-2,0 (0,9-2,3)	(2,7-4,1)	5,2-6,0 (4,9-6,3)
2.2 Supply pump LDA=0,75bar	n = rev/min	600		1980
	bar (kgf/cm²)	3,4-4,0		6,6-7,2
Overflow delivery	n = rev/min	600		1980 (0,75 bar)
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2150	max. 4,0		0,75
	2110		(8,0-16,0)	0,75
	1980	39,0-41,0	(37,7-42,3)	0,75
	1500		(39,7-44,3)	0,75
	1000	33,5-34,5	(31,0-37,0)	0,3
	600	24,5-25,5	(22,0-28,0)	0
switch-off elektr.	400	0		
Idle stop	475		(4,0-12,0)	
	600	max. 3,0		
End stop	350	min. 32,0		
	450	max. 38,0		

2.4 Solenoid — max. cut-in voltage xxxx min., 10 V
xxxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,65-5,95
MS	1,2-1,4
SVS	5,7
A	
B	

Observations

After each LDA pressure change operate control lever.

12.83

H21

Test Specification Fuel Injection Pumps and Governors

Testoil-ISO 4113

40

WPP 001/4 HAN 10,8 e

5. Edition

En

superseded 6.79

PE 6 A 95 D 320 RS2364 EP/RSV 350-1100 A8 B1104DR (1)
RS2364 350-1100 A8 B1103DR (2)
RS2557 350-1100 A8 B1116DR (3)
ABC 1116 R (3)

company MF-Hanomag

engine D 962 (1)
D 963 (2)
D 963 (3)

** Cold-start test according to VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (2 - 3) cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery (1) cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,8	10,5 - 10,7	0,3(0,6	10,0	9,0 - 9,3	
	+0,1			+0,1		
350	5,9-6,1	0,9 - 1,4	0,3(0,5	6,7-6,9	1,4 - 2,0	
700/500	- - -	C, 4-5	0,4(0,7			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

1104DR (1)

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca.25	350	5,5	1100	
.	x =	4,5							10,7-10,8	
							100	min. 19	500	
ca.56	9,0	1140-1150					350	5,9-6,1		
(5)	4,0	1170-1200					490-550	=2,0	11,4-11,5	
	1370	0,3 - 1,7					650	0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to .. rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
(1) 1100	89,0 - 91,0 (87,0 - 93,0)	1140-1150*	700	93,0 - 96,0 (91,0 - 98,0)	100	20,0-20,5 mm RW **		
			500	83,5 - 86,5 (81,5 - 88,5)				./.

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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B. Governor Settings

1103DR u. 1116DR (2-3)

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca.25	350	5,5	1100	
	x =	5,5							10,8-	10,9
							100	min. 19	975	
							350	5,9-6,1	11,0-	11,2
ca.56	9,8	1140-1150					490-550	=2,0		
(2a)	4,0	1180-1210					650	0 - 1	500	
	1365	0,3 - 1,7							11,5-	11,6

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
(2-3) 1100	103,5 - 105,5 (101,5 - 107,5)	1140-1150*	700	109,5 - 112,5 (107,5 - 114,5)				
			500	105,0 - 107,0 (103,0 - 109,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
(2a)										

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9

Checking values in brackets

* 1 mm less control rod travel than col. 2

H23

H23

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 HAN 10,8 h
4. Edition
En

Testoil-ISO 4113

PE 6 A 95 D 320 RS2557 EP/RSV 350-1100 A8B1117DR
A8C 1117 R

supersedes 10.81
company MF-Hanomag
engine D 962

Komb.-Nr. 0 400 676 157
** Cold-start test according to VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,0+0,1	9,1 - 9,3	0,3(0,6*)			
400	7,9-8,1	3,6 - 4,2	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.23	400	7,5		
	X =	4,50					100	min. 19	1100	10,0+0,1
ca.52	1140-1150 = 9,0						400	7,9-8,1	960	10,2+0,2
(5)	1205-1235 = 4,0						580-640 = 2,0		500	10,6+0,1
	1375 =	0,3-1,7					700	max.1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
1100	89,0 - 91,0 (87,0 - 93,0)	1140-1150*	700	93,0 - 96,0 (91,0 - 98,0)	100	19-21mmRW **	-	-
			500	83,5 - 86,5 (81,5 - 88,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H24

Test Specifications Fuel Injection Pumps and Governors

(1A)

WPP 001/4 DEE 7,6 f
1. Edition
En

PES 6 A 100 D 410 RS 3038 RSV 400-1100 A 2 B 2120 L

Komb.-Nr. 9 400 230 032

supersedes
company John Deere
engine 6 466 AT-05

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,95-2,05 (1,90-2,10) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control lever) mm 5
1100	10,8+0,1	10,8-11,0	0.3			
400	6,6-6,8	1,3-1,7	0,3			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 17	400	6,1	1100	10,8-10,9
									650	11,8-12,1
							100	min. 19,0		
ca. 40	9,8	1145-1155					400	6,6		
(2a)	4,0	1205-1235					480-540	= 2,0		
	1300	0,3-1,7					850	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5) (4a) Idle stop: rev/min 8	Control rod travel mm 9
1100	108,0-110,0 (105,0-113,0)	1145-1155*	650	115,5-118,5 (112,5-121,5)	100	170,0-195,0 = 21,0 mm	-	-
					High idle speed 1200	27,0-37,0	RW	
					Low idle speed. 400	13,0-17,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.84

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

J1

J1

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 KHD 6,1 a

4. Edition

En

PES 6 A 85 D 410/3 RS 2366 EP/RSV 325-1400 A8B674D, 707 D
325-1150 A8B674D, 707 D

RS 2415 *** Instruction:

RS 2532 Test details see page 3!

supersedes 6.82
company K H D
engine BF 6 L 913

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1000	9	4,1 - 4,5	0,4			
	6	0,6 - 1,4				
200	9	1,4 - 2,2				

Adjust the fuel delivery from each outlet according to the values in ▭

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
ca.69	1400 1450 1500	16,0 10,5 4,0	without auxiliary spring			ca.20	325	5,5	1400	0
							200 325 500 650	19 - 21 5,2-5,8 1,2-3,3 0 -1,5	500	1,2-1,4
ca.68 (2a)	1400 1510 1600	ca.10,0 ca. 4,0 0,3-1,5	with auxiliary spring							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full load stop, Test oil temp. 40 C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational speed limitat. Note changed to ... rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA ***	0,7 bar	****	LDA ***	0,7 bar	100	119,5- 129,5	325	5,5**
			LDA 500	0 bar 43,5 - 47,5				
(inrease by 1,0 cm³!)								./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

J2

The numbers denote the sequence of the tests

B. Governor Settings

EP/RSV 325-1150 A8P674D, 707 D

(1) Upper rated speed rev/min			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.56	1150	16,0	without auxiliary spring			ca. 21	325	5,5	1130	0
	1200	11,1								
	1250	5,4					200	19 - 21		
							325	5,5-5,8	500	1,0-1,2
	1220	7,5-10,4					500	1,4-3,4		
(2a)	1300	1,3-3,6	with auxiliary spring				660	0 -1,5		
	1380	0,3-1,5								

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F)		(6) Rotational-speed limitat	(3a) Fuel delivery characteristics		Starting fuel delivery (5) Idle		(4a) Idle stop	
rev/min	cm³/1000 strokes	Note changed to) rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1 LDA	2 0,7 bar	3	4 LDA	5 0,7 bar	6	7	8	9
***		****	***		100	119,0-129,*	5;325	5,5**
			LDA	0 bar				
			500	43,5 - 47,5				
***	See page 3							

Checking values in brackets

* 1 mm less control rod travel than col 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing ~~increasing~~ pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- ~~difference~~ diminution mm
all governors	0,38	0,10	0,2 - 0,3 1,6 - 2,0

Notes

(1) when n = rev/min and gauge pressure bar (maximum full load control rod travel)

En

J3

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

BF 6 L 913 - PES 6 A D..RS2366, 2415 F or B output at ... min^{-1}

1400	88,0 - 90,0	1420	800	80,0 - 83,0	160 PS	/	n = 2800
1400	84,0 - 86,0	1420	800	66,0 - 69,0	142 PS	/	n = 2800
1325	90,5 - 92,5	1340	850	88,5 - 90,5	168 PS	/	n = 2650
1325	87,5 - 89,5	1340	800	82,5 - 85,5	160 PS	/	n = 2650
1325	82,5 - 84,5	1340	800	67,5 - 70,5	140 PS	/	n = 2650
1250	87,0 - 89,0	1270	800	84,5 - 87,5	160 PS	/	n = 2500
1250	83,0 - 85,0	1270	800	77,5 - 80,5	148 PS	/	n = 2500
1250	81,0 - 83,0	1270	800	75,5 - 77,5	140 PS	/	n = 2500
1200	86,0 - 88,0	1220	800	84,5 - 87,5	156 PS	/	n = 2400
1200	78,0 - 80,0	1220	800	68,0 - 71,0	135 PS	/	n = 2400
1165	84,0 - 86,0	1180	800	84,5 - 87,5	152 PS	/	n = 2330
1150	83,5 - 85,5	1165	800	84,5 - 87,5	152 PS	/	n = 2300
1150	79,0 - 81,0	1165	800	72,0 - 74,0	142 PS	/	n = 2300
1100	82,0 - 84,0	1115	800	84,5 - 87,5	147 PS	/	n = 2200
1075	82,0 - 84,0	1090	800	84,5 - 87,5	144 PS	/	n = 2150
1075	78,0 - 80,0	1090	800	76,0 - 79,0	136 PS	/	n = 2150
1050	76,5 - 78,5	1065	800	73,5 - 76,5	130 PS	/	n = 2100
1000	82,5 - 84,5	1015	800	84,5 - 87,5	137 PS	/	n = 2000
1000	77,0 - 79,0	1015	800	79,5 - 82,5	130 PS	/	n = 2000
900	82,0 - 84,0	910	800	84,5 - 87,5	125 PS	/	n = 1800
875	68,0 - 70,0	885	800	66,0 - 69,0	106 PS	/	n = 1750
750	85,0 - 87,0	760	-	-	105 PS	/	n = 1500
750	78,0 - 80,0	760	-	-	100 PS	/	n = 1500

Please note

1. ** With Liebherr exavators: single-lever control, therefore use shorter screw 1 423 400 031 and set this at 0,3 - 1,0 before the stop.

2. LDA adjustement to be carried out according to VDT-W- 420/305

3. Dimension H = 22,5 mm = basic setting of LDA.

Checking values in brackets

* 1 mm less control rod travel than col 2

(5)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 2,0 g 4

5. Edition

En

supersedes 12.82

PES 4 M 50 C 320 RS 103
RSF 375/2250 M 19
Komb. Nr. 0 400 074 978 Sales model 0 400 074 977

company Daimler-Benz
engine OM 615
44 kW (60 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80 (1,65-1,85) mm (from BDC) Control rod travel 18,5-21,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (compensating valve) mm 5
1000	12,7+0,1	3,2-3,3	0,25 (0,3)			
375	6,9-7,1	0,65-0,75	0,1 (0,15)			
1800			0,25 (0,3)			
2200			0,25 (0,3)			

Set uniform delivery according to the values in [ ]

Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever 1		Control rod travel mm 2	Rotational speed rev/min 3	Upper rated speed: Degree of deflection of control lever 4		Control rod travel mm 5	Rotational speed rev/min 6	Variations in control rod travel 7	Rotational speed rev/min 8	Control rod travel mm 9
13-17	(1)	min.12,5	250	50	(7)	11,8-12,0	2200	(12)	100	min. 20,3
		max.12,0	300		(8)	7,2-7,6	2500	(13)	1800	12,2-12,4
	(2)	6,9-7,1	375		(9)	-	-	(14)	1000	12,7-12,8
	(3)	**	400		(10)	0-1,0	2950			
	(4)	-	-		(11)			Switching point (6)		
	(5)	2,5	720-820							

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19) Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	Full-load speed regulation (8a) rev/min 3	Variations in fuel delivery rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (17) Idle (18) rev/min 6	cm³/1000 strokes 7	Difference cm³/1000 strokes 8	
2200	33,0-35,0 (32,0-36,0)	2500* RW 7,2-7,6	1800	33,0-35,0 (32,0-36,0)	100	min. 55,0	6,0	(12a)
			1000	32,0-33,0 (31,0-35,0)	375	6,5-7,5 (5,5-9,0)	1,0	
							1,5	(15)
					2500	13,0-17,0 (12,0-18,0)	2,5 siehe	
							3,0 Pkt.	
							8a	(16)

Checking values in brackets

ca. 3,5 XXXXX travel than in Column 2

1.84

J5

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
1980 by Robert Bosch GmbH Postfach 50 D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J5

1. ** Position the idle-speed auxiliary spring at n = 385 min^{-1} so that the control-rod travel is forced further by 0.1 - 0.2 mm.

2. Adjusting the idle control-lever position:

   At 1000 min^{-1}, control-rod travel 1.9 - 2.0 mm.

3. Testing the idle-speed auxiliary spring shutoff

   Control-lever position 47^{0}. No change in control-rod travel after switching point up to 550 min^{-1}.

   Control-lever position 30^{0}. Rotational-speed range 350 min^{-1} - 450 min^{-1}.

4. Testing the pneumatic shutoff box

   Control lever against idle stop.

   At n = 375 min^{-1} and 450 mbar (vacuum) (338 mmHg) the control rod must move briskly to RW (control-rod travel) = 0 mm.

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 MB 2,4 j
3. Edition
En

Testoil-ISO 4113

PES 4 M 55 C 120 RS 106
RSV 350 - 1500 MOB 128
Komb.-Nr. 0 400 064 033

Sales model
0 400 064 035

supersedes 4.80
company Daimler-Benz
engine OM 616
38 kW

1-3-4-2-0-90-180-270 ± 0,5(0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80 (1,65-1,65) mm (from BDC) RW = 18,5-21,5 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 5	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1500	12,8+0,1	3,7-3,8	0,25(0,3)			
350	6,8-7,0	0,6-0,8	0,1(0,15)			
1000	13,7-13,9		0,25(0,3)			
600	14,0-14,2		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3.) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca. 18	350	6,4	1500	12,8-12,9
							350	6,8-7,0	1000	13,7-13,9
ca.53	1550-1570 = 11,9						100	min.20,3		
(2a)	1650-1680 = 4,0						900	max. 1,5	600	14,0-14,2
	1850 = 0,3-1,7						770-830	2,5		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) idle: rev/min 6	cm³/1000 strokes 7	(4a) ole stop: rev/min 8	Control rod travel mm 9
1500	37,0-38,0 (36,0-39,0)	1550-1570*	1000	37,5-39,5 (36,5-40,5)	100	min. 53,0	350	6,9
			600	38,0-40,0 (37,0-41,0)	350	6,0-8,0 (5,5-8,5)		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

J7

J7

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 2,4 K
3. Edition

En

Testöl-ISO 4113

PES 4 M 55 C 320 RS 106
RSV 350...1750 MOB 129

supersedes 4.80
company Daimler-Benz
engine OM 616
44 kW

Komb.-Nr. 0 400 064 034

1-3-4-2=0-90-180-270 ±0,5(0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80 (1,65-1,85) mm from BDC RW 18,5-21,5

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque control valve) mm 6
1730	13,1+0,1	3,85-3,95	0,25(0,3)			
300	6,8-7,0	0,6-0,8	0,1(0,15)			
1100	13,7-13,9		0,25(0,3)			
600	14,1-14,2		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca.18	350	6,4	1730	13,1-13,2
							1100	13,7-13,9
					100	min. 20,3	600	14,1-14,3
					900	max. 1,5		
ca.56 (2a)	1760-1780 = 12,2 1885-1915 = 4,0 1970 = 0,3-1,7				350	6,8-7,0		
					770-830	2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	(5) cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1730	38,5-39,5 (37,5-40,5)	1760-1780*	1100	37,5-39,5 (36,5-40,5)	100	min. 53,0	350	6,9
			600	38,0-40,0 (37,0-41,0)	350	6,0-8,0 (5,5-8,5)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

J8

J8

Test Specifications Fuel Injection Pumps and Governors (1A)

40

WP 001/4 MB 2,4 K 2

1. Edition

En

Testoil-ISO 4113

PES 4 M 55 C 320 RS 106 RSV 400-2200 MOB 351
Komb.-Nr. 0 400 074 081
Sales model 0 400 074 082
1-3-4-2 = 0-90-180-270 ± 0,50 (0,75)

supersedes: -
company Daimler-Benz
engine OM 616
53 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80 (1,65-1,85) mm from BDC RW = 20,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
2180	12,9+0,1	4,0-4,1	0,2(0,3)			
400	6,4-6,6	0,6-0,8	0,1(0,15)			
1000	13,4-13,5		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca.39	400	6,5	1000 1750	13,4-13,5 13,1-13,4
ca.70 (2a)	2240-2250 = 12,0 2370-2390 = 4,0 2550 = 0,3-1,7				Set auxiliary idle control-rod travel		spring at 2,0 mm	

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
2180	40,0-41,0 (39,0-42,0)	2240-2250*	1000	37,0-38,0 (36,0-39,0)	100 400	min. 53 6,0-8,0 (5,5-9,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

J9

J9

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 2,4 m 1

2. Edition

En

PES 4 M 55 C 320 RS 107 - 1
RSF 375/2250 M 17
Komb. Nr. 0 400 074 956 Sales model 0 400 074 957

1 - 3 - 4 - 2
0 - 90-180-270

supersedes 5.83
company Daimler Benz
engine OM 616
53 kW (72 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm from BDC 18,5-21,5 Control rod travel

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	$13,9^{+0,1}$	3,9-4,0	0,25(0,3)			
375	6,5-6,7	0,6-0,7	0,1 (0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever		Control rod travel mm	Rotational speed rev/min	Upper rated speed: Degree of deflection of control lever		Control rod travel mm	Rotational speed rev/min	Variations in control rod travel: Rotational speed rev/min	Control rod travel mm
1		2	3	4		5	6	8	9
9-13	(1)	min.11,5	250	50	(7)	13,0-13,2	2200	(12) 100	min. 20,3
	(2)	max.11,0	300		(8)	8,7-9,1	2500	(13)	
	(3)	6,5-6,7	375		(9)	-	-	1800	13,3-13,5
		**	400					(14) 1000	13,9-14,0
	(4)	-	-		(10)	0-1,0	2950		
	(5)	2,5	720 - 820		(11)	-		(6) Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full load delivery (10) Test oil temp 40°C (104°F) rev/min	cm³/1000 strokes	Full load speed regulation (8a) rev/min	Variations in fuel delivery (17) (18) rev/min	cm³/1000 strokes	Starting fuel delivery Idle rev/min	cm³/1000 strokes	Difference cm³/1000 strokes
1	2	3	4	5	6	7	8
2200	39,5-41,5 (38,5-42,5)	2500* RW 8,7-9,1	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 (12a)
			1000	39,0-40,0 (38,0-41,0)	375	6,0-7,0 (5,5-9,0)	1,0 1,5 (15)
					2500	23,0-27,0 (22,0-28,0)	2,5 See 3,0 Point 8 a (16)

Checking values in brackets

*ca. 4,2 less control rod travel than in Column 2

1.84

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

J10

1. ** Position the idle-speed auxiliary spring at n = 385 min^{-1} so that the control-rod travel is forced further by 0.1 - 0.2 mm.

2. Adjusting the idle control-lever position:

   At 1000 min^{-1}, control-rod travel 1.9 - 2.0 mm.

3. Testing the idle-speed auxiliary spring shutoff

   Control-lever position 47^{o}. No change in control-rod travel after switching point up to 550 min^{-1}.

   Control-lever position 30^{o}. Rotational-speed range 350 min^{-1} - 450 min^{-1}.

4. Testing the pneumatic shutoff box

   Control lever against idle stop.

   At n = 375 min^{-1} and 450 mbar (vacuum) (338 mmHg) the control rod must move briskly to RW (control-rod travel) = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 3,0 o 2
2. Edition
En

PES 5 M 55 C 320 RS 108-1
RSF 350/2300 M 16
Komb. Nr. 0 400 075 987 Sales model 0 400 075 988

superseded 5.83
company Daimler-Benz
engine OM 617
65 kW (88 PS)

Testoil-ISO 4113

1 - 2 - 4 - 5 - 3
0 - 72-144-216-288:0,50 (0,75)
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm (from BDC) Control rod travel 18,5-21,5

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	$13,9^{+0,1}$	3,9-4,0	0,25(0,3)			
350	6,5-6,7	0,6.0,7	0,1 (0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever		Control rod travel mm	Rotational speed rev/min	Upper rated speed: Degree of deflection of control lever		Control rod travel mm	Rotational speed rev/min	Variations in control rod travel: Rotational speed rev/min	Control rod travel mm
1		2	3	4		5	6	8	9
9-13	(1)	min.10,5	250	50	(7)	13,0-13,2	2200	(12) 100	min. 20,3
	(2)	max.10,0	300		(8)	9,1-9,5	2500	(13) 1800	13,5-13,7
	(3)	6,5-6,7	350		(9)	-	-	(14) 1000	13,9-14,0
	(4)	**	385						
		-	-		(10)	0-1,0	2950		
	(5)	2,5	780-820		(11)			Switching point (6)	

C. Settings for Fuel Injection Pump with Governor Mounted

Full load delivery (19) Test oil temp. 40 °C (104 °F) rev/min	cm³/1000 strokes	Full-load speed regulation (84) rev/min	Variations in fuel delivery rev/min	cm³/1000 strokes	Starting fuel delivery Idle (17) (18) rev/min	cm³/1000 strokes	Difference cm³/1000 strokes
1	2	3	4	5	6	7	8
2200	39,5-41,5 (38,3-42,5)	2500* RW 9,1-9,5	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 (12a)
			1000	39,0-40,0 (38,0-41,0)	350	6,0-7,0 (5,5-9,0)	1,0 1,5 (15)
					2500	23,0-27,0 (22,0-28,0)	2,5 See 3,0 Point 8 a (16)

Checking values in brackets

ca.4,0 less control rod travel than in Column 2

1.84

J12

J12

1. ** Position the idle-speed auxiliary spring at n = 385 min^{-1} so that the control-rod travel is forced further by 0.1 - 0.2 mm.

2. Adjusting the idle control-lever position:

   At 1000 min^{-1}, control-rod travel 1.9 - 2.0 mm.

3. Testing the idle-speed auxiliary spring shutoff

   Control-lever position 47^{o}. No change in control-rod travel after switching point up to 550 min^{-1}.

   Control-lever position 30^{o}. Rotational-speed range 350 min^{-1} - 450 min^{-1}.

4. Testing the pneumatic shutoff box

   Control lever against idle stop.

   At n = 375 min^{-1} and 450 mbar (vacuum) (338 mmHg) the control rod must move briskly to RW (control-rod travel) = 0 mm.

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 MB 3,0 V 1
1. Edition
En

PES 5 M 55 C 320 RS 109 RSV 350-1650 MOB 350-1 supersedes Daimler-Benz
Komb.-Nr. 0400 075 003 company OM 617
Sales model 0 400 075 004 engine 57 kW

1-2-4-5-3=0-72-144-216-288 ±0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm from BDC RW = 20,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1530	13,5+0,1	4,0-4,1	0,2 (0,3)			
350	6,2-6,5	0,6-0,8	0,1 (0,15)			
750	14,0+0,1		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca.40	350	6,2-6,5	750	14,0-14,1
							1300	13,6-13,9
*ca.75 (2a)	1670-1680=12,5 * 1780-1800= 4,0 2000= 0,3-1,7		Set auxiliary	idle spring at		2.0 mm control-rod travel.		

The numbers denote the sequence of the tests Adjustment angle = 0° = horizontal control lever position.

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop: Test oil temp. 40 C (104 F) rev/min 1	cm³/1000 strokes 2	(6) Rotational speed limiter: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1630	40,0-41,0 (39,0-42,0)	1670-1680*	750	39,0-41,0 (38,0-42,0)	100	min. 53,0		
					350	6,0-8,0 (5,5-9,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

J14

J14

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 MB 3,0 v 2
1. Edition
En

PES 5 M 55 C 320 RS 109 RSV 400-2200 MOB 352

Komb.-Nr. 0 400 075 001
Sales model 0 400 075 002

superseded Daimler-Benz
company OM 617
engine 65 kW

1 - 2 - 4 - 5 - 3 = 0 - 72 - 144 - 216 - 288 ± 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm from BDC RW=20,0mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³ 100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
2180	13,2+0,1	4,1-4,2	0,2(0,3)			
400	6,2-6,4	0,6-0,8	0,1(0,15)			
1000	13,9+0,1		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca.39	400	6,3	1000 1500	13,9-14,0 13,5-13,8
* ca. 70 (2a)	2240-2250 = 12,2 2400-2420 = 4,0 2550 = 0,3-1,7		Set auxiliary			idle spring at		2.0 mm control-rod travel.		

The numbers denote the sequence of the tests

* Adjustment angle = 0° = horizontal control lever position.

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40 C (104 F) rev/min 1	cm³ 1000 strokes 2	(6) Rotational speed limiter Note changed to rev/min 3	(3a) Fuel delivery characteristics rev/min 4	cm³ 1000 strokes 5	Starting fuel delivery (5) rev/min 6	cm³ 1000 strokes 7	(4a) Restrictor rev/min 8	Control rod travel mm 9
2180	41,0-42,0 (40,0-43,0)	2240-2250*	1000	39,0-41,0 (38,0-42,0)	100 400	min. 53 6,0-8,0 (5,5-9,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

BOSCH Geschäftsbereich KH Kundendienst Kfz Ausrüstung
1980 by Robert Bosch GmbH Postfach 50 D-7000 Stuttgart 1 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J15

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 3,0 v 3
1. Edition

PES 5 M 55 C 320 RS 109-1 RSV 400-2200 MOB 352 En

supersedes

Komb.-Nr. 0 400 075 005
Sales model 0 400 075 006

company Daimler-Benz
engine OM 617
65 kW

1 - 2 - 4 - 5 - 3 = 0 - 72 - 144 - 216 - 288 ± 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm (from BDC) RW = 20,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
2180	13,2+0,1	4,1-4,2	0,2(0,3)			
400	6,2-6,4	0,6-0,8	0,1(0,15)			
1000	13,9+0,1		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Control lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca.39	400	6,3	1000 1500	13,9-14,0 13,5-13,8
* ca.70 (2a)	2240-2250 = 12,2 2400-2420 = 4,0 2550 = 0,3-1,7		Set auxiliary idle spring at 2.0 mm control-rod travel.					

The numbers denote the sequence of the test steps

Adjustment angle = 0° = horizontal control lever position.

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop: Test oil temp. 40 °C (104 °F) rev/min 1	cm³/1000 strokes 2	(6) Rotational speed limiter: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
2180	41,0-42,0 (40,0-43,0)	2240-2250*	1000	39,0-41,0 (38,0-42,0)	100 400	min. 53 6,0-8,0 (5,5-9,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

BOSCH Geschäftsbereich KH Kundendienst Kfz Ausrüstung
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J16

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 3,0 V
1. Edition

En

Test No. 0 401 413

PES 5 M 55 C 320 RS 109-1 RSV 350-1650 MOB 350-1

supersedes -

company Daimler-Benz

engine OM 617
57 kW

Komb.-No. 0 400 075 007
Sales model 0 400 075 008

1 - 2 - 4 - 5 - 3 = 0 - 72 - 144 - 216 - 288 ± 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm from BDC RW = 20,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1630	13,5+0,1	4,0-4,1	0,2(0,3)			
350	6,2-6,5	0,6-0,8	0,1(0,15)			
750	14,0+0,1		0,25(0,3)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Degree of deflection of control lever 1	Upper rated speed rev/min: Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Control lever deflection in degrees 7	Lower rated speed: rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca. 40	350	6,2-6,5	750	14,0-14,1
							1300	13,6-13,9
*ca.75° (2a)	1670-1680 = 12,5 1780-1800 = 4,0 2000 = 0,3-1,7		Set auxiliary idle spring at 2.0 mm control-rod travel					

The numbers denote the sequence of the tests * Adjustment angle = 0° = horizontal control lever position.

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop: Test oil temp 40 C (104 F) rev/min 1	cm³/1000 strokes 2	(6) Rotational speed control: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery / idle: rev/min 6	(5) cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1630	40,0-41,0 (39,0-42,0)	1670-1680*	750	39,0-41,0 (38,0-42,0)	100	min. 53,0		
					350	6,0-8,0 (5,5-9,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

BOSCH Geschäftsbereich KH Kundendienst Kfz Ausrüstung
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J17

J17

Test Specifications Fuel Injection Pumps and Governors (1A)

40

WPP 001/4 PEN 6,0 e

3. Edition

En

Testoil-ISO 4113

PES 6 MW 100/320 RS 1004 RSV 325-1250 MW/308
0 403 476 011

supersedes 5.83
company Volvo/Penta
engine TD 60 D
118 kW (160 PS)

1- 5- 3 - 6 - 2 - 4
0-60-120-180-240-300 ± 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90 (2,75-2,95) mm (from BDC) RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque control valve) mm 6
1000	10,5+0,1	8,95-9,15	0,35(0,6)			
325	4,3-4,5	1,0 - 1,3	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0 x = 4,0		ca. 26	325	3,9	350	11,1+0,1
					325	4,3-4,5	500	10,7-0,1
ca.49 (2a)	1290-1330 = 9,6 1335-1365 = 4,0 1450 = 0,3-1,7				450-510	= 2,0	1250	10,5+0,1

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limiter, Note changed to: rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1000	89,5-91,5 (87,5-93,5)	1290-1300*			100	min. 140	325	4,4
					325	10,0-13,0 (7,5-15,5)		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

J18

J18

Test Specifications Fuel Injection Pumps and Governors

(1A)

WPP 001/4 Vol. 6,0 p
3. Edition

En

Testoil-ISO 4113

PES 6 MW 100/320 RS 1004
RSV 650-750 MW 4/311-1

0 403 476 009

supersede 5.82
company Volvo
engine TD 60 B 6
84 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,9+0,1	8,1-8,3	0,35 (0,6)			
650	5,0-5,1	1,7-2,1	0,35 (0,55)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca. 34	650	4,5	375	11,9+0,6
	X =						650	5,0-5,1	470	10,9+0,1
ca.40 (2a)	750-760 = 9,9 760-790 = 4,0 930 = 0,3-1,7						690-750 = 2,0			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
700	81,0-83,0 (79,0-85,0)	750-760 *						

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

J19

J19

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 PEN 6,0 r 4
1. Edition
En

Testoil-ISO 4113

PES 6 MW 100/320 RS 1004 RSV 650-750 MW 4/311-3

0 403 476 019

supersedes -
company Volvo-Penta
engine TD 60 DG
86 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90 (2,75-2,95) mm from BDC RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 5	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque control valve) mm 6
700	11,3+0,1	9,3-9,5	0,35 (0,6)			
650	4,5-4,6	1,7-2,1	0,35 (0,55)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca. 34	650	4,0	375	11,9-12,5
							650	4,5-4,6	470	11,3-11,4
ca.40 (2a)	750-760= 10,3 760-790= 4,0 930=0,3- 1,7						690-750 = 2,0			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes 7	(5) (4a) Idle stop: rev/min 8	Control rod travel mm 9
700	93,0-95,0 (91,0-97,0)	750-760*						

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

J20

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 PER 8,8 a 1
6. Edition
En

Testoil-ISO 4113

PES 8 MW 100/320 RS 1011
ROV 375... 1300 MW 18-1
Komb.-Nr. 0 403 448 102

supersedes 5.82
company Perkins
engine AV 8.540
138 kW

Port-closing mark on rear side

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) bei RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	10,1+0,1	9,2-9,4	0,3 (0,6			
375	5,0-5,1	1,05-1,45	0,3 (0,55)			
800	10,1+0,1		0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1300	15,2-17,8	30-50	700	4,7	ca. 11	100	min. 6,5	1390-1410	8,7
	1600	0,0- 1,0		450	8,3		375	4,9-5,0	515-575	2,6
ca. 64	9,1 4,0	1365-1375 1425-1455				(3a)	470-530=2,0		375	1,2-1,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1300	92,0-94,0 (90,0-96,0)	1365-1375*	800	87,0-91,0 (85,0-93,0)	100	min. 140 (19 - 21 RW)		
					375	10,5-14,5 (8,0-17,0)		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

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J21

J21 A

Port closing and TDC markings

Comb.-No.	° camshaft between port-closing and TDC	at control-rod travel 21 mm (Start)
... 102	at control-rod travel 10,5 mm	11°
	17°	

Test Specifications Fuel Injection Pumps and Governors (1)

WPD 001/4 RVI 8,8k
6. Edition
En

Testoil-ISO 4113

PES 6 MW 100/320 PS 1016
ROV 300-1300 MW 25
Komb.-Nr. 0 403 446 123

supersedes 1.83
company RVI
engine MIDR06.02-12
125 kW (170 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Port-closing mark 10,5° after port closing.

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW = 9,0 - 12,0

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	11,1+0,1	8,95-9,15	0,35(0,6)			
300	5,7-5,8	0,95-1,35	0,35(0,55)			
900	11,1+0,1		0,5 (0,7)			
500	9,8-9,9					

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1300 1650	15,2-17,8 0 - 1,0				ca.13	200 300	max. 7,5 5,8-5,9		
ca.62	10,1 3,9	1355-1365 1485-1515				340-600 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1300	0,67 bar 89,5-91,5 (87,5-93,5)	1355-1365*	LDA 900	0,67 bar 85,0-89,0 (83,0-91,0)	100 300	95,0-105,0 9,5-13,5 (7,0-16,0)		
			LDA 500	0 bar 56,0-58,0 (54,0-60,0	100-230 (80-250)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

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J23

D. Adjustment Test for Manifold Pressure Compensator

[illegible] 500 rev/min decreasing / increasing pressure = n bar gauge pressure

Pump [illegible]	Setting	Measurement	Control rod travel	Simulation difference
	Gauge pressure bar	Gauge pressure bar	mm	
RS 1016 - MW 25	0,23		10,7-10,9	
		0,67	11,1-11,2	
		0	9,8-9,9	
		0,20	10,2-10,3	

Notes

(1: when n [illegible] rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

② WPP 001/4 KHD 9,6g
3. Edition
En

Testoil-ISO 4113

PE 6 MW 100/720 LS 1017 RO 300/1250 MW 26

0 403 546 003

1 - 6 - 5 - 4 - 3 - 2

0 -75 -120-195-240-315 ±0,50 (0,75)

supersedes 11.82
company KHD
engine F6L413FX
150 kW (205 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,10-3,20 (3,05-3,25) mm (from BDC) RW = 9,0 - 12 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,9+0,1 11,1-11,3		0,5(0,6)			
350	8,2-8,4	1,25-1,65	0,35(0,55)			
700	12,7+0,1		0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	19,2-20,8	600	20,0	11,6	1295-1310	300	8,3	100	min.9,9	700	12,7-12,8
				4,0	1345-1375			350	8,2-8,4	850	12,4-12,5
1450	0,0-1,0							380-440 = 2,0		1100	11,9-12,0

1 mm less control rod travel

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1250	111,0-113,0 (109,0-115,0)		700	109,5-113,5 (107,5-115,5)	100	126,5-136,5 (123,5-139,5)
					350	12,5-16,5 (10,0-19,0)
					100-270	(80-300)

Checking values in brackets

1.84

K1

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 RVI 5,5 a

2. Edition

En

Testoil-ISO 4113

PES 6 MW 80/320 RS 1104
RSV 300-1450 MW 2/801

0 403 476 013

supersedes 5.83
company RVI
engine MD 060212
97,8 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,75-1,85 (1,70-1,90) mm from BDC RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	10,4-10,5	5,05-5,25	0,25(0,4)			
300	4,7-4,9	0,85-1,15	0,2(0,35)			
1450	9,4-9,5		0,35(0,45)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca. 20	300	4,8	900	10,4-10,5
	x =	4,0			250	max. 8,4	1450	9,4-9,5
ca.58	8,4	1515-1525					1150	9,6-9,8
(2a)	3,9	1555-1585						
	0-1,0	1650						

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	(5) cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
900	50,5-52,5 (49,5-53,5)	1515-1525*	1450	54,0-56,0 (52,0-58,0)	100	max. 15 mm RW 75,0-85,0 (70,0-90,0)		
					300	8,5-11,5 (7,0-13,0)		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

K2

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 IHC 7,6 a
3. Edition

Testoil-ISO 4113

PES 6 MW 100/320 RS 1504
RSV 350 ... 1250 MW 2/305 R DHK 1 688 901 016
0 403 476 004 207 + 3 bar

supersedes 3.80
company IHC
engine DT 466

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,20-3,30 (3,15-3,35) mm (from BDC) / 10,5 mm RW

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque control valve) mm 6
1250	7,3 +0,2	6,9 - 7,1	0,3 (0,5)			
350	5,5 - 5,7	1,8 - 2,2	0,3 (0,5)			
1000			0,3 (0,5)			
800			0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca. 32	350	5,6	1100	7,3-7,5
					100	min. 19	1000	7,8-8,0
ca.60 (2a)	1300-1310=6,4 1360-1390=3,1 1450= 0,3=1,7				350 430-490	5,5-5,7 = 2,0	800 500	8,5-8,7 8,6-8,8

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40 C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1250	69,0-71,0 (68,0-72,0)	1300-1310*	1000	76,0-78,0 (75,0-79,0) 82,5-84,5	100 350	min.140 18,0-22,0 (17,0-23,0)	350	5,6
			800	(81,5-85,5)	1375	25,0-37,0 (24,0-38,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

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Test Specifications Fuel Injection Pumps and Governors

(1A) WPP 001/4 IHC 7,6b
3. Edition
En

Testoil ISO 4113

PES 6 MW 100/320 RS 1504
RSV 350 ... 1200 MW 2/306 R
0 403 476 005

DHK 1688 901016
207 + 3 bar

supersedes 3.80
company IHC
engine DT 466

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,20-3,30 (3,15-3,35) mm from BDC bei 10,5 mm RW

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	7,4±0,2	6,5-6,7	0,3 (0,5)			
350	5,7-5,9	1,8-2,2	0,3 (0,5)			
1000			0,3 (0,5)			
800			0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800 = 0,3-1,0					ca. 32	350	5,8	1100	7,5-7,7
							100	min. 19	1000	8,1-8,3
ca. 60 (2a)	1250-1260=6,5 1310-1340=3,1 1450 = 0,3-1,7						350	5,7-5,9	800	8,6-8,8
							430-490	= 2,0	500	8,7-8,9

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104 F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1200	65,0-67,0 (64,0-68,0)	1250-1260*	1000	72,0-74,0 (71,0-75,0)	100	min. 140	350	5,8
			800	78,0-80,0 (77,0-81,0)	350	18,0-22,0 (17,0-23,0)		
					1325	24,0-36,0 (23,0-37,0)		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

K4

K4

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MWM 39,8 b
2. Edition
En

Testoil-ISO 4113

(1) PE 6 P 120 A 300/3 LS 267
(2) PE 6 P 120 A 320 LS 268 RSUV 300-750 P 9 A 332/1 R
(3) PE 6 P 120 A 300 LS 330

supersedes 1.82
company Südbremse
engine D/TD/TBD 602 V 12
TBD 602 V 12 S

1 - 5 - 3 - 4 - 2 - 6 (1) /1 - 6 - 2 - 4 - 3 - 5 (2 u. 3)
0 -15 -120-135-240-255 ± 0,5°(±0,75°)/0 -15 -120-135-240-255 ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr. 0 401 806 046 (1)
0 401 876 214 (2)
0 401 816 052 (3)

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3 - 2,4 (2,25-2,45) mm (from BDC) bei RW = 21.0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,0+0,1	26,0 - 26,4 (25,7 - 26,7)	0,5 (0,9)			
300	5,5-5,7	2,6 - 3,2	0,8 (1,2)			

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
lose	800	0,3-1,0	-	-	-	ca.29	300	5,1	700	13,0+0,1
	X =	5,25							325	14,2+0,6
							100		450	13,0+0,1
							300	5,5-5,7		
ca.70 (5)	12,0	790 - 800					315-375=2,0 mm			
	4,0	815 - 845								
	980	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump without(1),(3)and Fitted Governor (2)

(2) Full-load stop: Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle XXXXXXX: rev/min 6	cm³/1000 strokes XXXXXXXXXXX mm RW 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
					100	19,5-21,0		

The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.
Pumps (1) and (2) or (1) and (3) operate in tandem.

Checking values in brackets

* 1 mm less control rod travel than col 2

7.83

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Test Specifications Fuel Injection Pumps and Governors

NPP 001/4 MWM 19,9 b
3. Edition
En

Testoil-ISO 4113

(1) PE6P 120 A 320 RS 353 RSUV 300-750 P 9 A 333/1 R
(2) PE6P 120 A 300/3 RS 342
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes 8.82
company MWM - Südbremse
engine D/TD/TBD 601-6
601-6 S
Komb.-Nr. 0 401 876 215 (1)
0 401 816 053 (2)

All test specifications are valid for Bosch Fuel-Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3-2,4 (2,25-2,45) mm (from BDC) RW=19,5 - 22,5 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,0+0,1	26,0 - 26,4 (25,7 - 26,7)	0,5 - (0,9)			
300	5,5-5,7	2,6 - 3,2	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings (1)

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.29	300	5,1	700	13,0-13,1
	x = 5,25								450	13,0-13,1
							100		325	14,2-14,8
							300	5,5-5,7		
ca.70 (5)	12,0=790-800						2,0=	315-375		
	4,0=815-845									
	980 =0,3-1,7									

The numbers denote the sequence of the tests without (2) and

C. Settings for Fuel Injection Pump With Fitted Governor (1)

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7 mm RW	(5a) Idle stop: rev/min 8	Control rod travel mm 9
The full-load delivery ia adjusted on the engine in accordance with the engine inspection sheet.					100	19,5-21,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

10.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 ALO 13,8 b

1. Edition

En

PES 6 P 120 A 320 RS 354 RQV 375-1050 PA 314 KR
Komb.-Nr. 0 402 046 159

supersedes

company Allis Chalmers

engine 6138 I

A.C.-Nr. 743 96 184

Values only apply to test nozzle-and-holder assembly 0 681 443 022 and fuel-injection test tubing 1 680 750 026.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testöl-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	26,4-27,1	1,0			
600	6,0	8,6-9,8	1,0			
600	12,0	26,3-28,2	1,0			
600	15,0	33,8-36,2	1,0			
200	6,0	4,2-5,2	1,0			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
ca.66	1050	15,0-18,0	-	-	-	ca.10	250	6,4-8,0	-	-
	1100	10,7-15,0					350	3,0-5,2		
	1150	6,0-11,6					450	1,3-2,8		
	1210	0-7,0					550	0		
	1300	0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1050	210,0-216,0 (208,0-218,0)	1060-1080*	900	210,0-216,0 (207,0-219,0)	100	130,0-170,0		
			700	238,0-244,0 (235,0-247,0)	300	19,0-25,0		

Checking values in brackets

* 1) mm less control rod travel than col 2

0,1 12.83

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K7

k 7

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 DEE 10,1 a 2
1. Edition

En

PES 6 P 110 A 720 RS 370 RSV 500-900 PO/448 DR
Komb.-Nr. 0 402 076 048

supersedes
company John Deere
engine 6619 T

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,75-2,85 (2,70-2,90) mm from BDC

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 5
900	10,6+0,1	12,3-12,5	0,4			
500	6,4-6,6	1,9-2,3				

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Lower rated speed: Control rod travel mm 9	(3) Torque control: rev/min 10	Torque control: Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 26	500	6,4	900	0
							100	19,0-21,0	650	0,7
							500	6,4		
ca. 42 (2a)	1000	6,4					660-720	= 2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat: Note changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) / Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
900	123,0-125,0 (120,0-128,0)	945-955*	650	138,5-141,5 (135,5-143,5)	100	180,0-200,0	500	6,4
					High idle speed			
					1000	47,0-57,0		
					Low idle speed.			
					500	19,0-23,0		

Checking values in brackets

* mm less control rod travel than col 2

2.84

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

K8

K8

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 17,4 b 8

1. Edition

PE 10 P 120 A 520/5 LS 850 RQV 250-1150 PA 670-2 En

supersedes

company MAN

engine D 2540 MLE 405 kW

Komb.-Nr. 0 401 849 179

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ± 0,5° (± 0,75°)
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,2+0,1	18,5 - 18,7	0,5 (0,9)			
250	6,2-6,4	1,2-1,8	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever (3a) 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1210	15,2-17,8	-	-	-	ca. 12	100	min. 7,8	300	1,7-2,0
ca. 63	10,2	1190-1200					250	6,2-6,4	800	5,6-5,9
	4,0	1210-1240					375-435	= 2,0	1150	7,8
	1400	0 - 1,0								

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	1.0 bar	1190-1200 *	LDA	0 bar	100	205,0-225,0	-	-
1150	185,0-187,0		500	119,0-121,0		(201,0-229,0)		
	(182,0-190,0)			(116,0-124,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

K9

JK 9

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel-	Diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
PE 10P.. LS 850 + RQV.. PA 670-2	1,0	0	11,2-11,3	
		0,65	9,6-9,7	
		0,54	10,8-10,9	
			10,1-10,3	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

K10

En K10

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 8,0 h
5. Edition

En

PE 6 P 110 A 720 RS 3034 RQV 200-1200 PA 529

Komb.-Nr. 0 401 846 732

supersedes 6.83
company Scania
engine DSI 801

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,3 - 3,4 (3,25-3,45) mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,2+0,1	12,9 - 13,1	0,5(0,7)			2,5 ± 0,1
225	5,5-5,7	1,2 - 1,6	0,2(0,4)			(2,2 - 2,9) **

Adjust the fuel delivery from each outlet according to the values in ☐

** In case valve-spring spread is higher, change the initial tension accordingly.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 14	100	min.7,0	150	0,5-0,8
							225	5,5-5,7	500	3,7-4,3
ca. 64	12,2	1240-1250							850	6,2-6,4
	4,0	1395-1425					390-450 = 2,0			
	1550	0 - 1,0							1200	8,6
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
LDA 700	0,9 bar 129,0-131,0 (127,0-133,0)	1240 - 1250*	LDA 1200	0,9 bar 134,5-137,5 (132,0-140,0)	100	190,0-240,0 = 20,0-21,0 mm RW	-	-
			LDA 500	0 bar 79,0-83,0 (77,0-85,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

1.84

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D. Adjustment Test for Manifold Pressure Compensator

SCA 8,0 h

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump-governor	Setting	Measurement	Control rod travel-	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
PE 6 P..RS 3034 + RQV..PA 529	0,90	0	13,2 - 13,3	
		0,44	11,3 - 11,4	
		0,29	12,7 - 12,8	
			11,7 - 11,9	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MWM 39,8 c
2. Edition
En

Testoil-ISO 4113

(1) PE 6 P 130 A 300 LS 3051
(2) PE 6 P 130 A 320 LS 3052 RSUV 300-750 P 9 A 332/1 R
(3) PE 6 P 130 A 300 LS 3052

supersedes 1.82
company MWM - Südbremse
engine TBD 602-V 12 K

1 - 5 - 3 - 4 - 2 - 6 (1)
0 -15 -120-135-240-255° ± 0,5° (± 0,75°)

1 - 6 - 2 - 4 - 3 - 5 (2 u. 3)
0 -15 -120-135-240-255° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Komb.-Nr. 0 401 816 703 (1)
0 401 876 711 (2)
0 401 816 705 (3)

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm from BDC bei RW = 21,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,0+0,1	34,7 - 35,1 (34,4 - 35,4)	0,5 (0,9)			
300	5,3-5,5	4,8 - 5,6	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
lose	800	0,3 - 1,0	-	-	-	ca.29	300	4,9	700	12,0+0,1
	X =	5,25							325	13,2+0,6
							300	5,3-5,5	450	12,0+0,1
ca.70 (5)	11,0	790 - 800					325-385=2,0mm			
	4,0	815 - 845								
	980	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump without(1),(3)and Fitted Governor (2)

(2) Full-load stop: Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat: Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle XXXX rev/min 6	cmXXXXXXXXXXX mm RW 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet. Pumps (1) and (2) or (1) and (3) operate in tandem.					100	19,5-21,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MWM 19,9 c
3. Edition
En

Testoil-ISO 4113

(1) PE 6 P 130 A 320 RS 3057 RSUV 300-750 P 9 A 333/1R
(2) PE 6 P 130 A 300 RS 3056

supersedes 8.82
company MWM - Südbremse
engine TBD 601-6 K

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr. 0 401 876 712 (1)
0 401 816 704 (2)

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC) bei RW = 21,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,0+0,1	34,7 - 35,1 (34,4 - 35,4)	0,5 - (0,9)			
300	5,3-5,5	4,8 - 5,6	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.28	300	4,9	700	12,0+0,1
	x = 4,75								325	13,2+0,6
							300	5,3-5,5	450	12,0+0,1
ca. 66	11,0	790-800								
(5)	4,0	815-845								
	980	0,3-1,7								

The numbers denote the sequence of the tests without (2) and

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note changed to rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting-fuel delivery idle: rev/min 6	cm³/1000 strokes 7 mm RW	(5a) Idle stop: rev/min 8	Control rod travel mm 9
The full-load delivery ia adjusted on the engine in accordance with the engine inspection sheet.					100	19,5-21,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

7.83

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K14

Test Specifications Fuel Injection Pumps ② and Governors

PE 8 P 110 A 320 LS 3802-1 RQ 300/1150 PA 187-11
Komb.-Nr. 0 401 848 751
1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45° ±0,5° (±0,75°)
See Service Information VDT-I-401/102

superseded 9.83
company Daimler-Benz
engine OM 422
206 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 -4,1 (3,95-4,15) mm (from BDC) Zyl. 8; RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery * cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery * cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,3+0,1	13,1-13,3	0,4(0,75)	12,3+0,1	13,1-13,3	
300	8,5-8,7	1,5- 2,1	0,45(0,75)	8,5-8,7	1,5-2,1	
600	-	C, Sp. 4 u. 5	(0,9)	-	C, Sp. 4 u.5	
	* with return throttle		(1)	*	without return	throttle (2)

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider PRG check ① Control rod travel rev/min 1	mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
650	13,0-14,0	650	13,5	11,3	1195-1210	300	8,6	100	min. 10,0	-	-
				4,0	1235-1265			300	8,5-8,7		
				1350	0-1,5			430-470	= 2,0		
								500	max. 1,8		

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1195-1210 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ② rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
(1) 1150	131,0-133,0 (128,5-135,5)	600	600	110,0-114,0 (107,0-117,0)	100	130,0-150,0 (126,0-154,0)

Checking values in brackets

12.83

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation				Idle speed regulation				Torque control ③	
		Setting point		Test specifications ④		Setting point		Test specifications ⑤			
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
650	13,0-14,0	650	13,5	11,3 4,0 1350	1195-1210 1235-1265 0 - 1,5	300	8,6	100 300 430-470 500	min.10,0 8,5-8,7 = 2,0 max. 1,8	-	-

Torque-control travel on flyweight assembly dimension a = * mm

Speed regulation At 1195-1210 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Testoil-ISO 4113

Full-load delivery on governor control lever Test oil temp 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
						Control rod travel
rev/min	cm^3/-1000 strokes	rev/min	rev/min	cm^3/-1000 strokes	rev/min	cm^3/1000 strokes / mm
1	2	3	4	5	6	7
(2) 1150	131,0-133,0 (128,5-135,5)	600	600	112,0-116,0 (109,0-119,0)	100	130,0-150,0 (126,0-154,0)

Checking values in brackets

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation				Idle speed regulation				Torque control ③	
		Setting point		Test specifications ④		Setting point		Test specifications ⑤			
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
						Control rod travel
rev/min	cm^3/-1000 strokes	rev/min	rev/min	cm^3/-1000 strokes	rev/min	cm^3/1000 strokes / mm
1	2	3	4	5	6	7

En Checking values in brackets

K16

K16

Test Specifications Fuel Injection Pumps ① and Governors

NPP 001/4 MB 14,6c1
2. Edition

En

PE 8 P 110 A 320 LS 3802-1 RQV 300-1150 PA 524-9

supersedes 9.83

company Daimler-Benz

engine OM 422
206 kW

Komb.-Nr. 0 401 848 752

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45° ±0,5° (±0,75°)

See Service Information VDT-I-401/102

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 -4,1 (3,95-4,15) mm (from BDC) Zyl. 8: PW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery * cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery * cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,3+0,1	13,1-13,3	0,4(0,75	12,3+0,1	13,1-13,3	
300	8,0-8,2	1,5- 2,1	0,45(0,75)	8,0-8,2	1,5-2,1	
600	-	C, Sp. 4 u. 5	(0,9)	-	C, Sp. 4 u.5	
	* with return throttle		(1)		* without return throttle (.)	

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3 (1a) (2a)	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6 (4)	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9 (3)	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 21	100	min. 9,7	250	1,0-1,2
ca. 66	11,3	1190-1200					300	8,0-8,2	550	3,4-3,7
	4,0	1235-1265							850	4,9-5,3
						330-465 (3a)			1150	7,6

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1150 (1)	131,0-133,0 (128,5- 135,5)	1190-1200*	600	110,0-114,0 (107,0-117,0)	100	130,0-150,0 (126,0-154,0)	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

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B. Governor Settings

Upper rated speed: Degree of deflection of control lever	Upper rated speed: rev/min Control rod travel mm	Upper rated speed: Control rod travel mm rev/min (1a)	Intermediate rated speed: Degree of deflection of control lever (2a)	Intermediate rated speed: rev/min	Intermediate rated speed: Control rod travel mm (4)	Lower rated speed: Degree of deflection of control lever	Lower rated speed: rev/min	Lower rated speed: Control rod travel mm (3)	Sliding sleeve travel (1): rev/min	Sliding sleeve travel (1): mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca. 21	100	min.9,7	250	1,0-1,2
ca. 66	11,3	1190-1200					300	8,0-8,2	550	3.4-3,7
	4,0	1235-1265							850	4,9-5,3
									1150	7,6
						330-465 (3a)				

Torque control travel a = - mm

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min	Full-load delivery: cm³/1000 strokes	Rotational-speed limitation intermediate speed (2b) (4a): rev/min	Fuel delivery characteristics high idle speed (5a) (5b): rev/min	Fuel delivery characteristics: cm³/1000 strokes	Starting fuel delivery idle switching point (6): rev/min	Starting fuel delivery: cm³/1000 strokes	Torque-control travel (5): rev/min	Torque-control travel: Control rod travel mm
1	2	3	4	5	6	7	8	9
(2)		1190-1200 *			100	130,0-150,0	-	-
1150	131,0-133,0		600	112,0-116,0		(126,0-154,0)		
	(128,5-135,5)			(109,0-119,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

Upper rated speed: Degree of deflection of control lever	Upper rated speed: rev/min Control rod travel mm	Upper rated speed: Control rod travel mm rev/min (1a)	Intermediate rated speed: Degree of deflection of control lever (2a)	Intermediate rated speed: rev/min	Intermediate rated speed: Control rod travel mm (4)	Lower rated speed: Degree of deflection of control lever	Lower rated speed: rev/min	Lower rated speed: Control rod travel mm (3)	Sliding sleeve travel (1): rev/min	Sliding sleeve travel (1): mm
1	2	3	4	5	6	7	8	9	10	11
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min	Full-load delivery: cm³/1000 strokes	Rotational-speed limitation intermediate speed (2b) (4a): rev/min	Fuel delivery characteristics high idle speed (5a) (5b): rev/min	Fuel delivery characteristics: cm³/1000 strokes	Starting fuel delivery idle switching point (6): rev/min	Torque-control travel (5): rev/min	Torque-control travel: Control rod travel mm
1	2	3	4	5	6	8	9

Checking values in brackets

* 1 mm less control rod travel than col 2

K18

En

K18

Test Specifications Fuel Injection Pumps and Governors ②

WPP 001/4 MB 18,3 f
2. Edition
En

PE 10 P 110 A 320 LS 3818 RQ 750 PA 636
Komb.Nr. 0 401 849 708
1 - 8 - 7 - 6 - 3 - 5 - 2 - 10- 9 - 4
0 -27 -72 -99 -144-171-216-243-288-315° ± 0,5° (± 0,75°)

supersedes 3.83
company Daimler-Benz
engine OM 423
197 kW (268 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,5+0,1	13,4-13,6	0,4(0,8)			
300	8,5-8,7	1,4-2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel min 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	12,5 4,0 900	750-755 790-800 0-1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm Speed regulation. At 750-755 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes/ mm 7
700	134,0-136,0 (131,0-139,0)	-	-	-	100	140,0-160,0 (136,0-164,0)

Checking values in brackets

2.84

K19

Test Specifications Fuel Injection Pumps (1) and Governors

WPP 001/4 MB 21,9 b
3. Edition

En

PE12P120A320LS3819-1 RQV 350-1150PA493
PA 493-2
1- 5- 9- 8- 3 - 4 - 11 -10- 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315 ±0,5 (±0,75)

supersedes 3.83
company Daimler-Benz
engine OM 424 A
390 kW (530 PS)
Komb.-Nr. 0 401 840 710

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0-4,1 (3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre tensioning (torque-control valve) mm 6
1150	11,1+0,1	15,9-16,1	0,5(0,8)			
350	4,8-5,0	1,4 - 2,0	0,8(1,2)			

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.14	100	min.8,5	300	0,9-1,1
ca. 64	10,1	1190-1200					350	6,9-7,1	580	3,5-3,7
	4,0	1280-1310							870	5,2-5,4
									1150	7,8
	1375	0-1,0				400-600 (3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,6 bar	1190-1200*	LDA	0,6 bar	100	140,0-160,0	-	-
1150	159,0-161,0 (156,0-164,0)		650	160,0-165,0 (157,0-169,0)		(136,0-164,0)		
1150	118,0-121,0 (115,0-164,0) **		LDA 500	0 bar 127,0-129,0 (124,0-132,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

** Ajusted at the inner lever of the reduced-delivery stop

2.84

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung.

K20

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump governor	Setting	Measurement	Control rod travel	Diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
PE12P..LS3819-1 + ..PA 493	0,38		10,8-10,9	
		0,60	11,1-11,2	
		0	10,0-10,2	
		0,32	10,1-10,3	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

K21

En K21

Test Specifications Fuel Injection Pumps and Governors

(1A)

WPP 001/4 SCA 14,2 e

1. Edition

En

PE 8 P 120 A 920/4 LS 7002-1 RSV 350-1050 P 1/504

1-2-7-3-4-5-6-8 je 45° ±0,5° (±0,75°)

Values only apply to test nozzle-and-holder assembly : 688 901 019 and fuel-injection test tubing 1 680 750 015

supersedes

company Saab-Scania DS 14 42

engine Komb.-Nr. 0 402 678 801

These specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-CO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 5,0-5,1 (4,95-5,15 mm from BDC RW=9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
700	13,2+0,1	18,7-18,9	0,6(0,9)			
350	4,4-4,6	1,4-1,8	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.30	350	4,4	-	-
	x =	6,0					350	4,4-4,6		
ca. 64 (2a)	12,2	1090-1100					440-500	= 2,0		
	4,0	1160-1190								
	1300	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat Note changed to rev/min 3	(3a) Fuel delivery charactenstics rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5) rev/min 6	cm³/1000 strokes 7	(4a) Idle stop rev/min 8	Control rod travel mm 9
700	187,0-189,0 (184,0-192,0)	1090-1100*	1050	183,0-191,0 (181,0-193,0)	100	240,0-290,0 =20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

K22

K22

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 VOG 22,6 a
2. Edition
En

PE 8 P 120 A 520/4 RS 7010 RQV 250-850 PA 686

1 - 4 - 6 - 2 - 5 - 3 - 7 - 8 je 45° ± 0,5° (± 0,75°)
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes 6.83
company Volgograd
engine 8 DWT 330
243 kW
Komb.-Nr. 0 402 648 809

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 5,0-5,1 (4,95-5,15) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	13,0+0,1	19,4-19,6	0,5(0,9)			
250	5,0-5,2	1,7-2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	935	15,2-17,8	-	-	-	ca. 9	100	min.6,6	250	1,1-1,3
							250	5,0-5,2	650	4,5-4,8
ca.61	12,0	890-900					340-400	= 2,0	850	7,2
	4,0	950-980				285-390				
	1100	0-1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,7 bar	890-900*	LDA	0 bar	100	245,0-265,0	-	-
850	194,0-196,0		500	125,0-127,0		(241,0-269,0)		
	(191,0-199,0)			(122,0-130,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

2.84

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure = in bar gauge pressure

Pump governor	Setting	Measurement	Control rod travel	Diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
PE8P..RS7010 + RQV..PA686	0,70		13,0 - 13,1	
		0	10,0 - 10,1	
		0,30	12,1 - 12,3	
		0,16	10,6 - 11,0	

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)